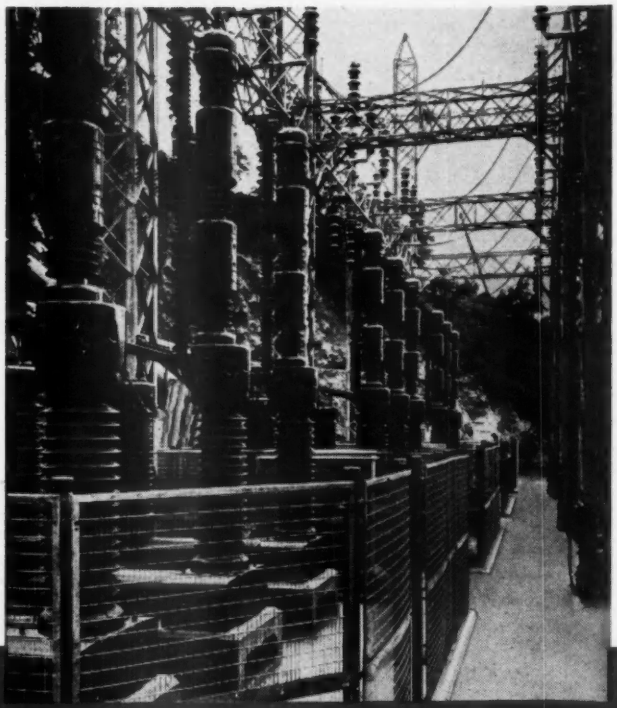
ELECTRICAL TIMES

THURSDAY
25 SEPT.
1952
NINEPENCE



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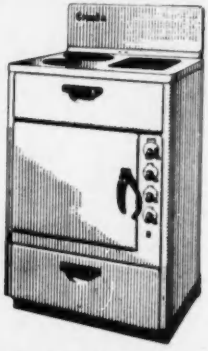

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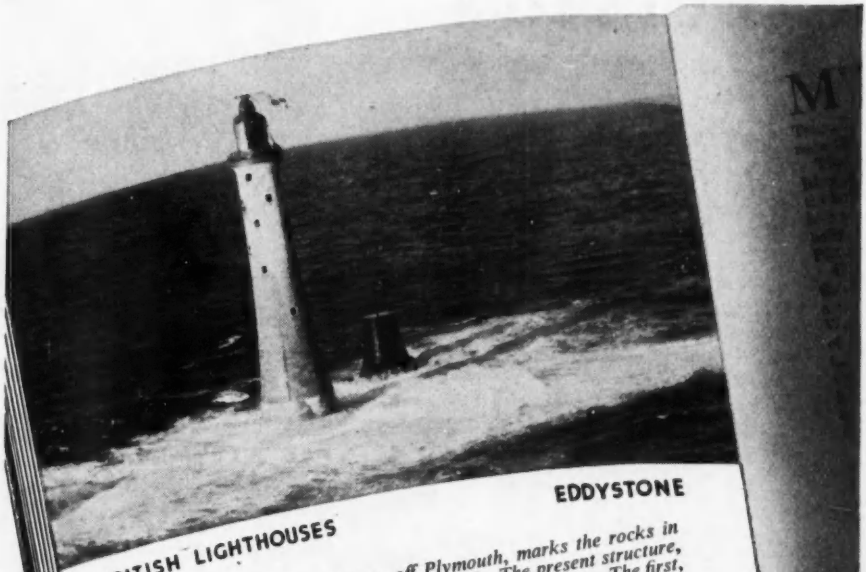

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Eddystone Lighthouse, 14 m. off Plymouth, marks the rocks in the fairway from the Start to the Lizard. The present structure, completed in 1882, is the fourth Eddystone Lighthouse. The first, made of wood and erected in 1696, was carried away in a storm seven years later. The second, also of wood, was burned down in 1755. The third was a circular tower, built by Smeaton between 1757 and 1759. Its remains can be seen in the photograph. The light from Eddystone is visible 17½ miles.

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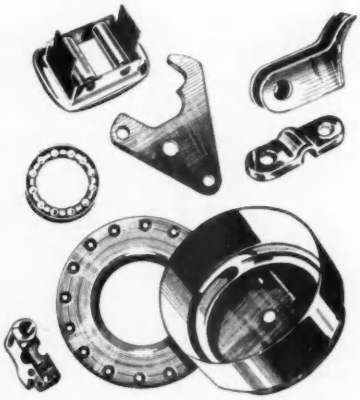

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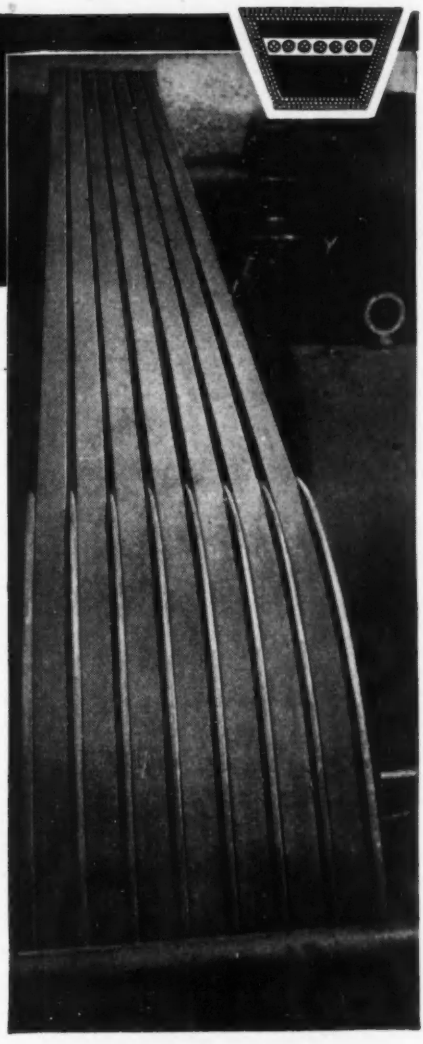
7 (endless) reasons



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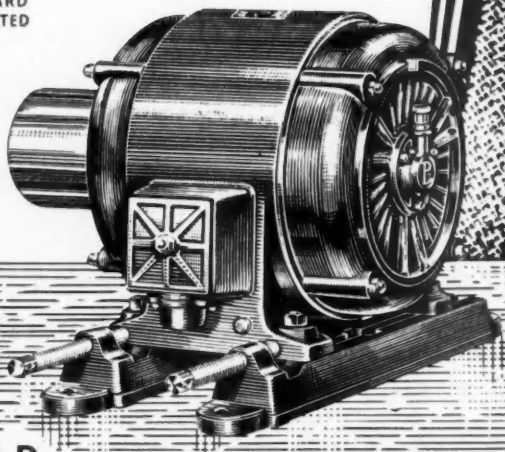

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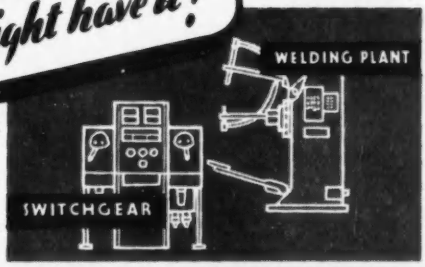

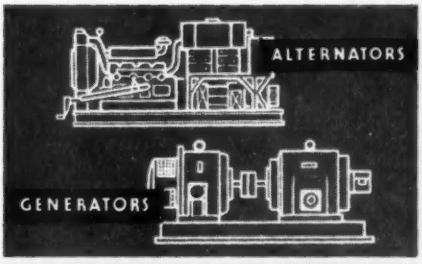

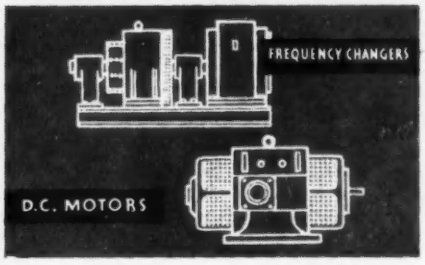

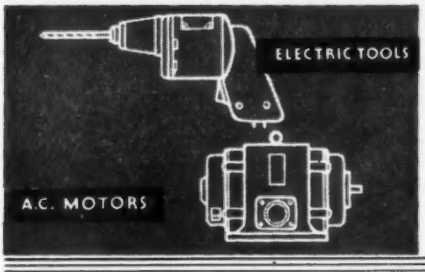

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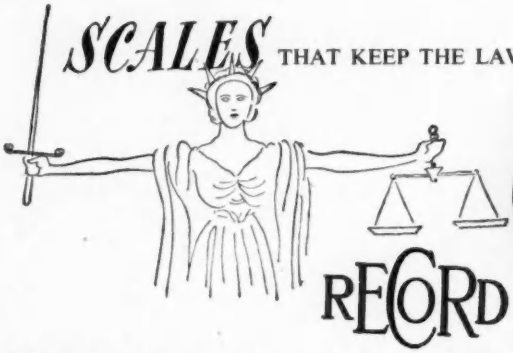

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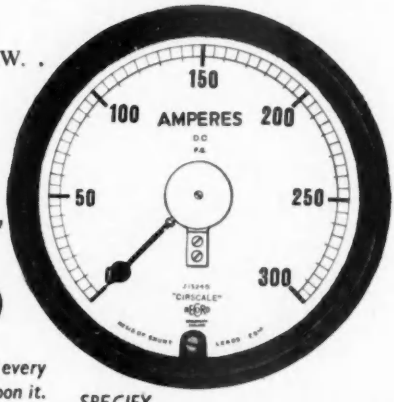

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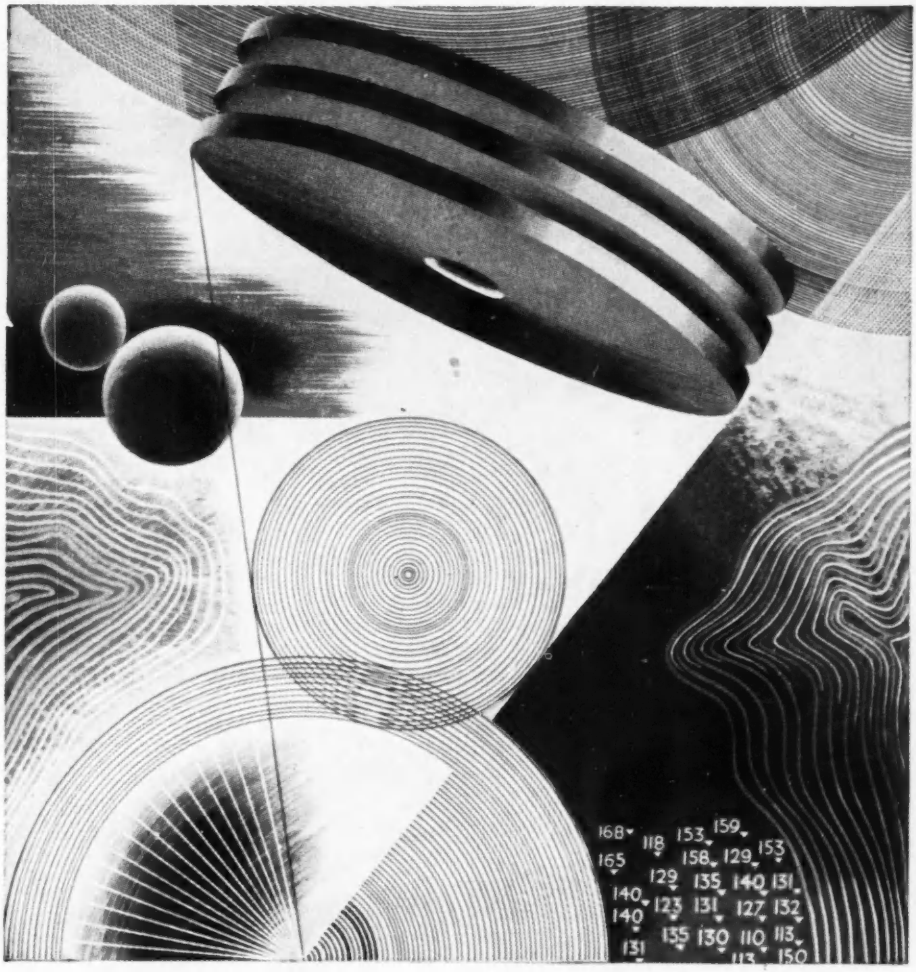

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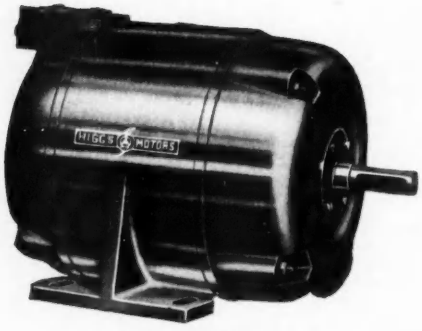

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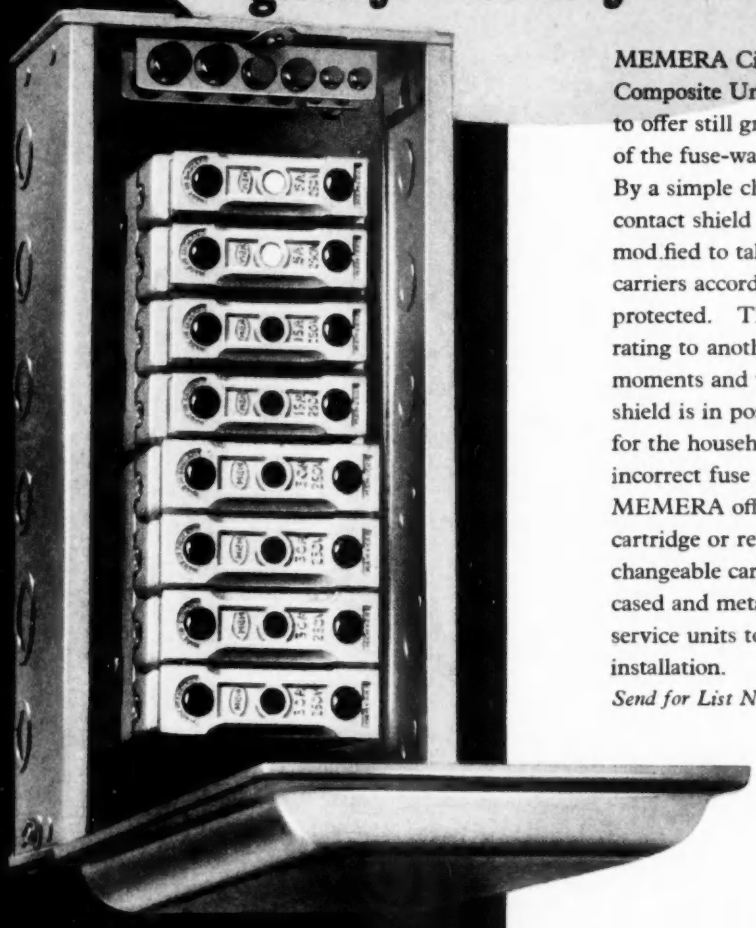
gives you fuseway flexibility



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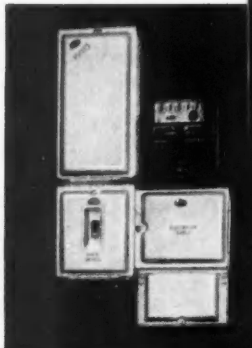

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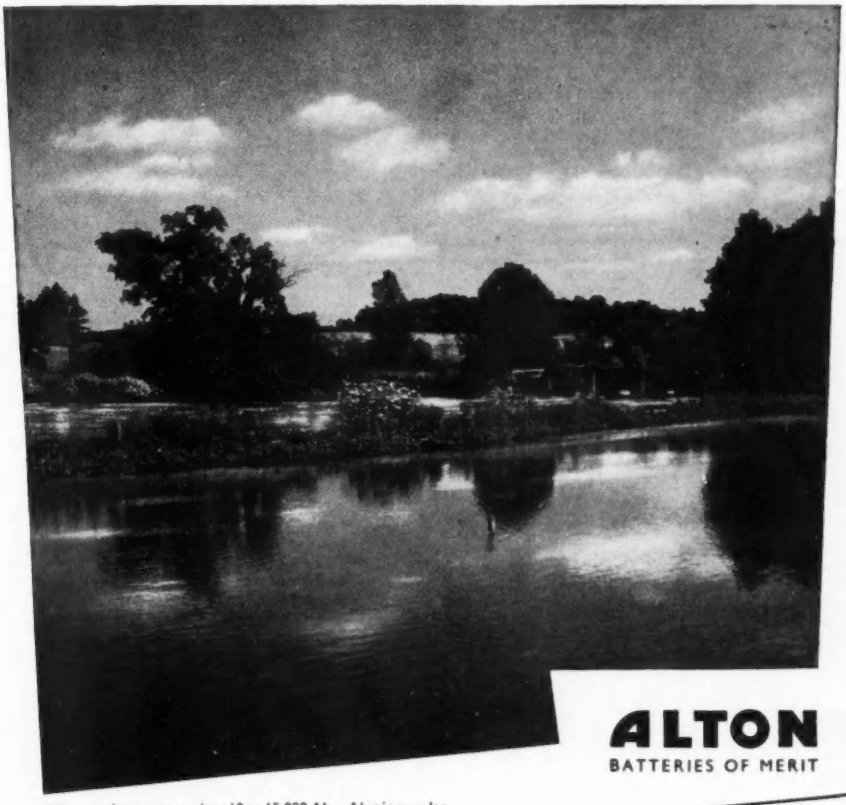

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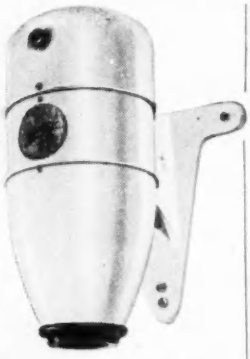

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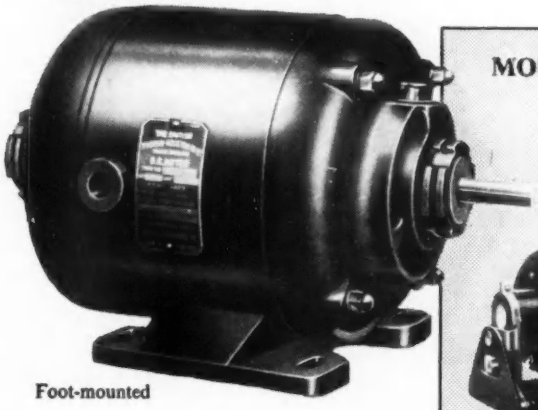

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⅛ H.P to 1 H.P.

D C compound-wound motors of the ventilated drip-proof pattern—built to exert four-and-a-half times full-load torque at starting—exceptional range of alternative mountings as illustrated.

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These motors comply fully with B.S. 170.

No manufacturer can offer a wider choice in fractional horsepower motors. Whatever the conditions of service or type of drive there is a BTH motor well suited to the job.

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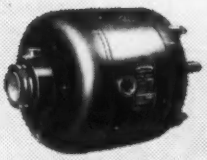
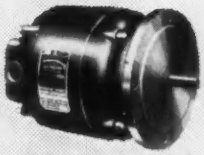
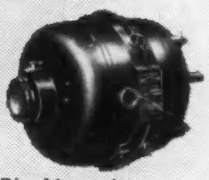
Resilient with Belt-tension Adjuster



Footless



Spigot (Vertical) Spigot (Horizontal)



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THE BRITISH THOMSON-HOUSTON CO., LTD., RUGBY, ENGLAND

Member of the A.E.I. group of companies

A3906

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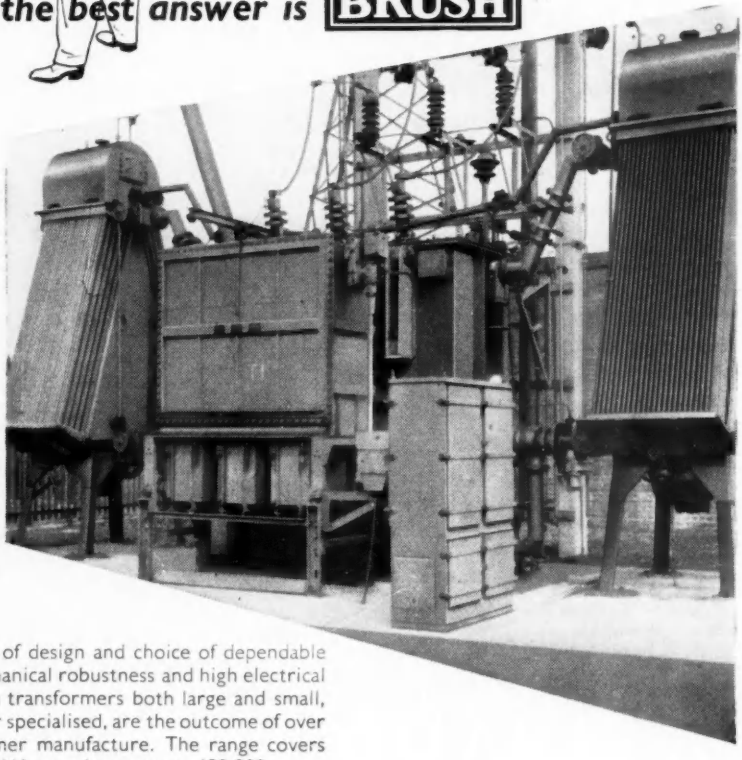
the best answer is BRUSH ***"***



The development of design and choice of dependable materials for mechanical robustness and high electrical efficiency in Brush transformers both large and small, straightforward or specialised, are the outcome of over 70 years transformer manufacture. The range covers from 5 to 45,000 kVA at voltages up to 132,000.

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MODEL 7 Universal AvoMeter

The world's most widely used combination electrical measuring instrument. It provides 50 ranges of readings on a 5-inch hand calibrated scale fitted with an anti-parallax mirror, and is guaranteed accurate to B.S. first-grade limits on D.C. and A.C. from 25c/s to 2 Kc/s. The movement is effectively damped to facilitate reading. The meter will differentiate between A.C. and D.C. supply, the switching being electrically interlocked. The total resistance of the meter is 500,000 ohms. The instrument is self-contained, compact and portable, and is protected by an **automatic cut-out** against damage through inadvertent application of overload. Power Factor and Power can be measured in A.C. circuits by means of an external accessory (the Universal AvoMeter Power Factor and Wattage Unit).

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CAPACITY: ·01 to 20 mFds.
AUDIO-FREQUENCY POWER OUTPUT: 0—2 watts.
DECIBELS: —25Db. to + 16Db.

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Size: 8" × 7¼" × 4½"
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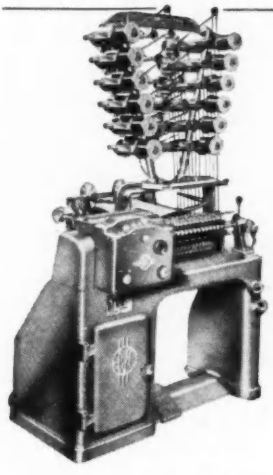

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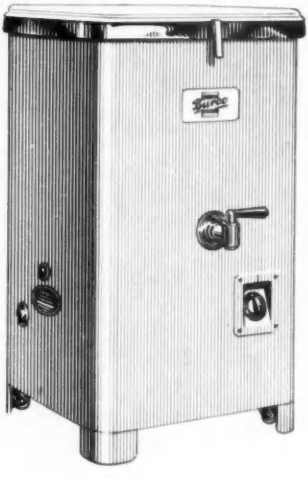

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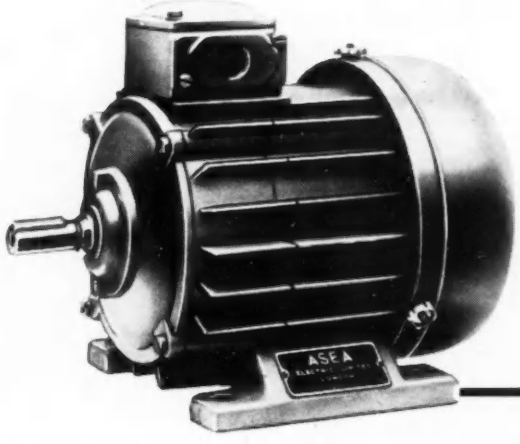

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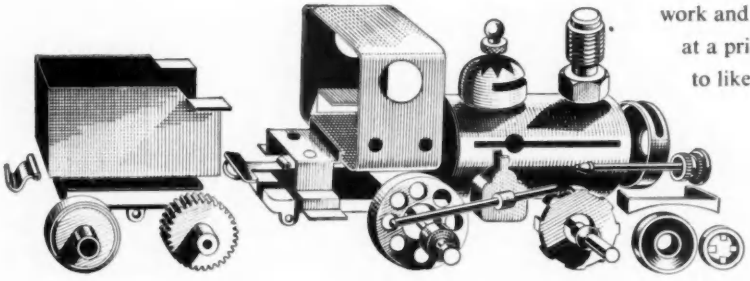

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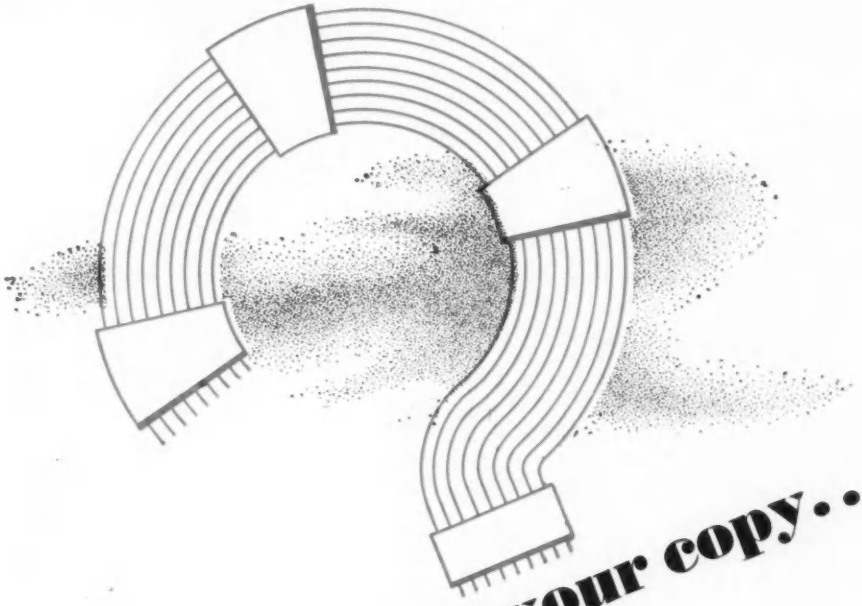

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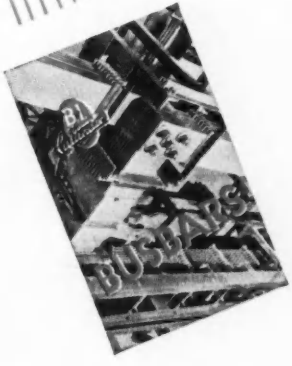

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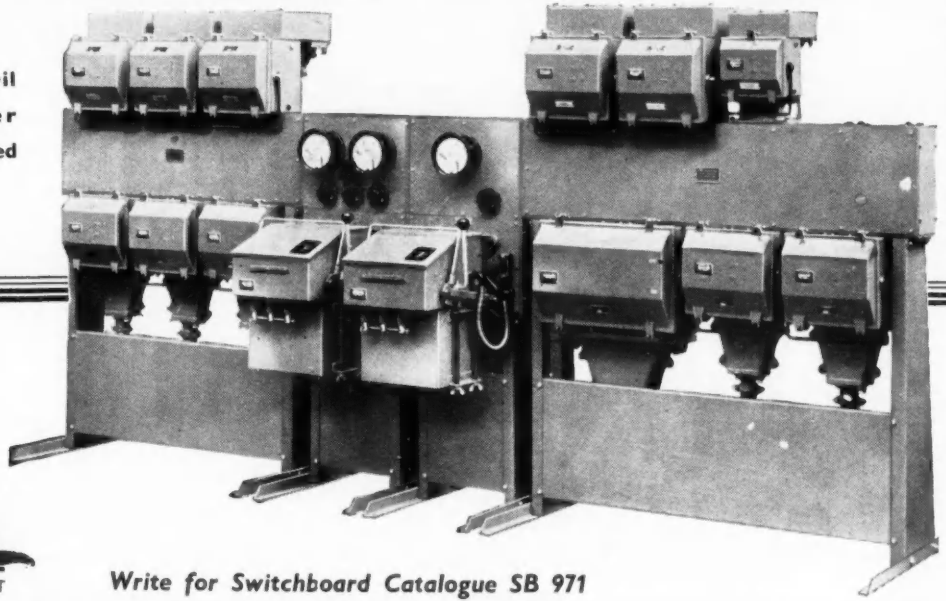

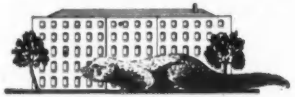

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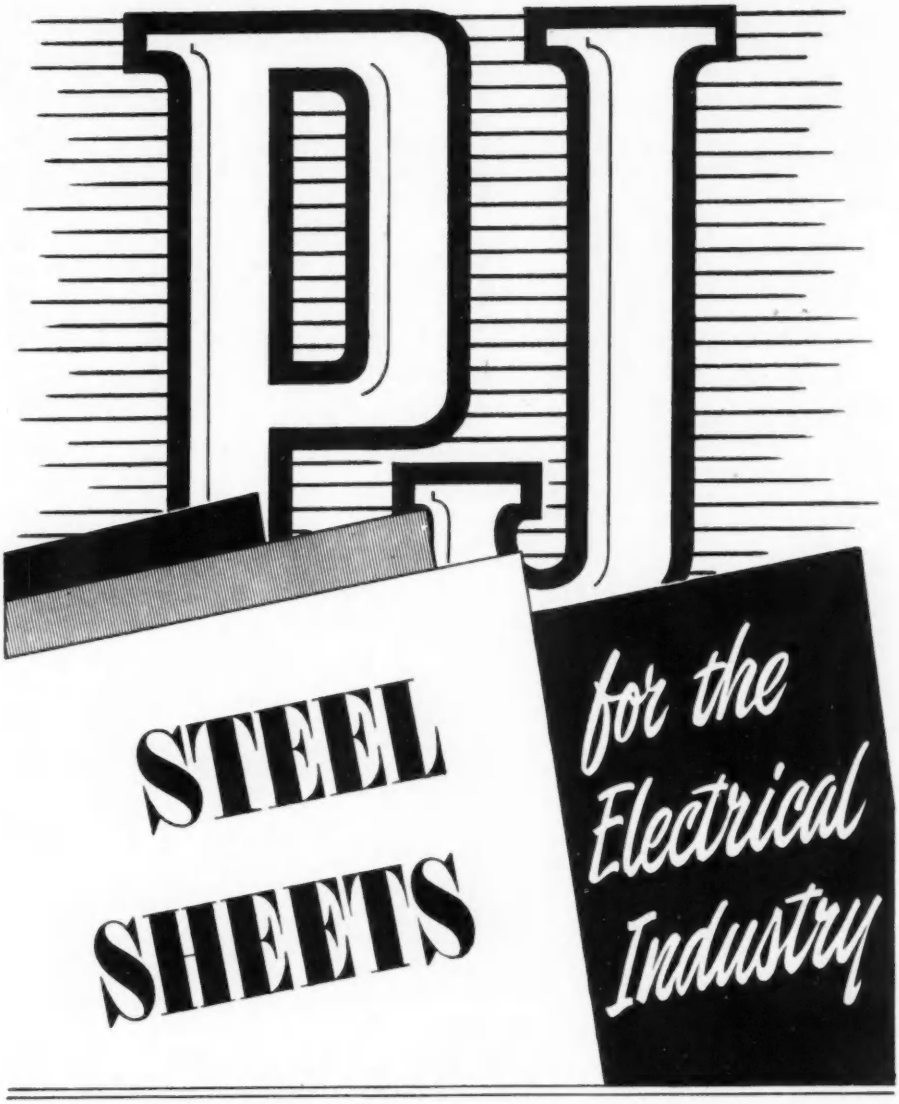

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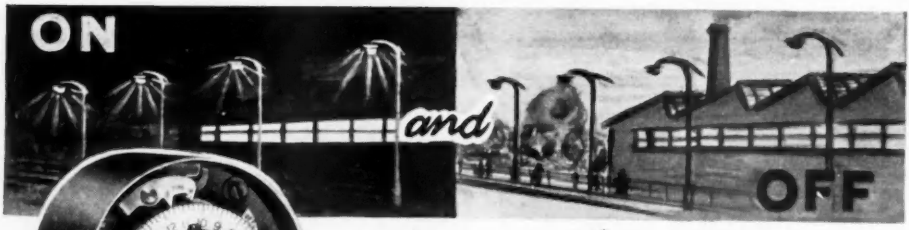

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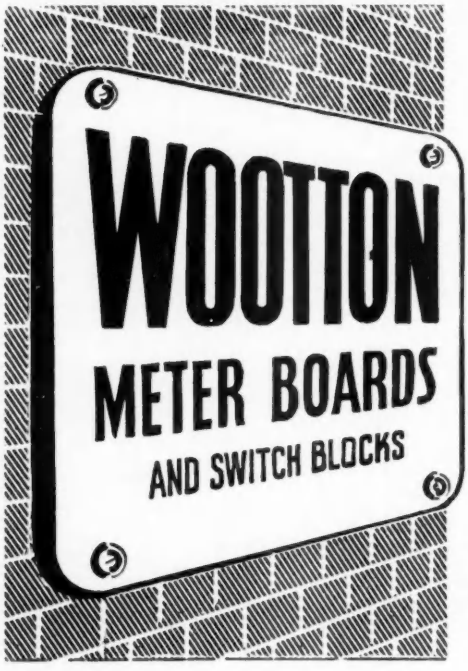

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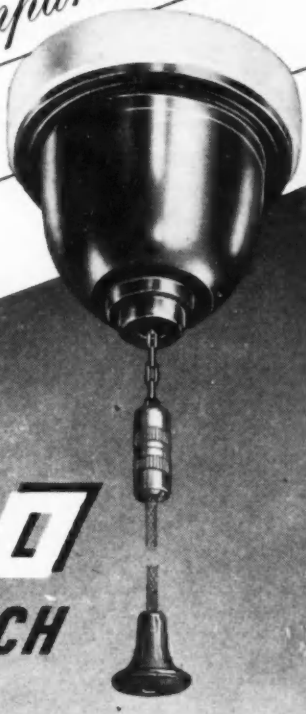

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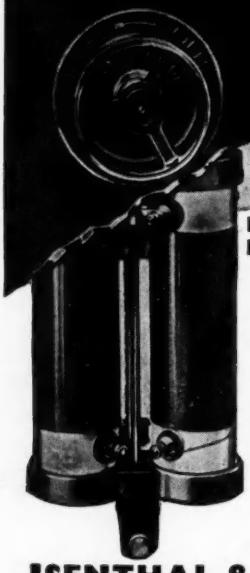

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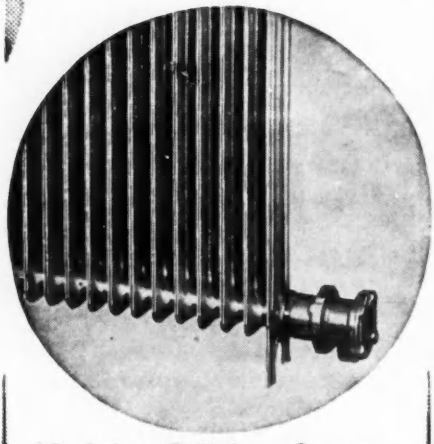

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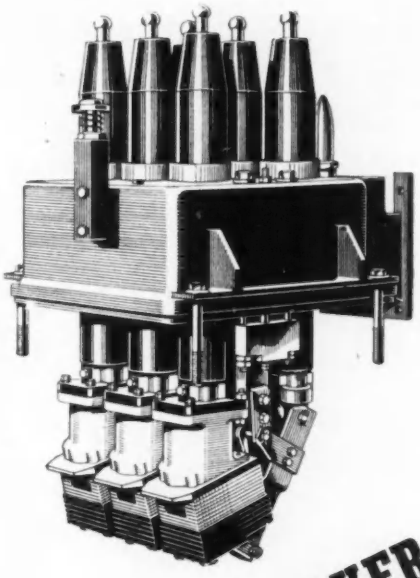


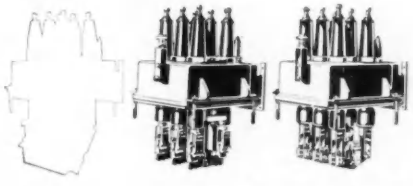
THE Trinal arc-control oil circuit-breaker is A.S.T.A. certified for 250 MVA at 6,600 and 11,000 volts, and has a maximum current rating of 1,200 amperes. It can be fitted to cubicle, truck or vertical isolation types of equipment.

It is a very compact design employing only 9 gallons of oil, and the efficiency of the arc-control device* over a wide range of short-circuit values is shown by the exceptionally good results obtained during the proving tests.

**Patents applied for.*

J. & P. TRINAL ARC-CONTROL BREAKER

ONE OF THE J. & P. TRINAL RANGE



The TRINAL Arc-control Breaker *The TRINAL Plain-break Breaker* *The TRINAL Oil Switch*

The J. & P. Trinal range comprises an oil switch and two types of oil circuit-breaker—an arc-control type and a plain-break type—all of which have similar fixing dimensions, enabling their ready and economical interchange should system modifications become necessary. Full details are given in Publication SG 86.

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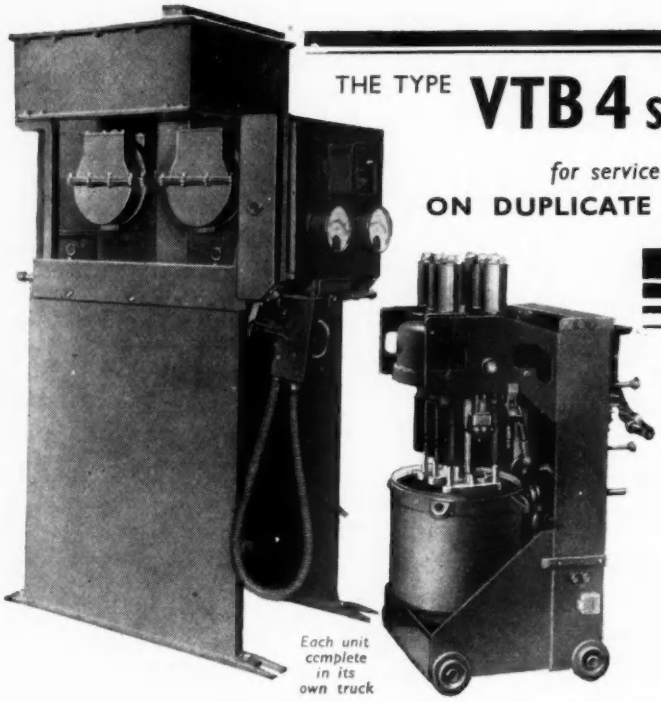


Each unit complete in its own truck

THE TYPE **VTB 4 SWITCHGEAR**

for service up to 11kV.

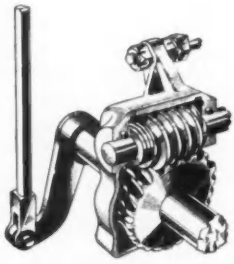
ON DUPLICATE BUSBAR SYSTEMS

The paramount advantage of having all mechanical and operating features embodied within the structure of the switch unit is self evident.

These features are built into the type VTB 4 switch unit which has an established record of satisfactory service in both substation and capital station installations where the advantages provided by a duplicate busbar system are required.

Complete interlocking of each unit ensures an adequate safeguard against human error, and simple and positive interlocks are provided to prevent :—

(a) *Insertion or withdrawal of truck unless O.C.B. is fully lowered.*
(b) *Raising of O.C.B. without its tank in position.*
(c) *Plugging in or isolation of O.C.B. unless it is open.*
(d) *Closing of O.C.B. unless fully plugged home.*
(e) *Closing of O.C.B. unless trip circuits fully connected.*



Each truck has its own integral raising and lowering mechanism to facilitate busbar selection and breaker isolation. Inspection and maintenance of the circuit breaker is, therefore, possible in complete safety, with the truck withdrawn entirely from the unit.

Further details of this, and other types of Switchgear of Ferguson Pailin manufacture, will be sent to executives and officials on request

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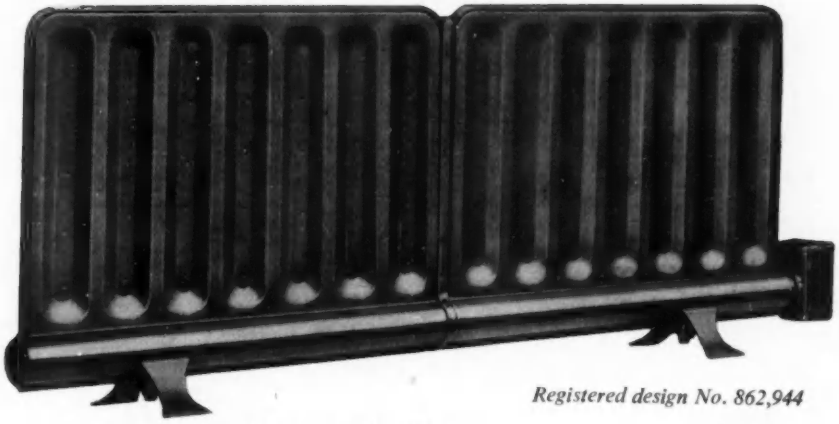
Model Illustrated 56″ x 20″. Rating 1000 and 1500 watt.



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Dimensions: 28″ × 20″

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Price Reductions and a New Range

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PRECISION MADE . . . . . housed in extra strong canisters with thicker bases for greater robustness.

IMPROVED VACUUM TECHNIQUE giving extremely long Switch life.

IMPROVED PACKING . . . . to reduce risk of breakage in stock and during transit.

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S2001	A.C. universal glow	4 soldered	Normal	30w., 40w., 80w.	Aluminium	5/-
S2002	D.C. glow	2 solid	Normal	30w. & 40w.	Pink	5/-
S2003	D.C. glow	2 solid	Small	30w. & 40 w.	Pink	4/6
S2005	A.C. universal glow	2 solid	Normal	30w., 40w., 80w.	Gold	5/-

Price Reductions to Existing Range

Cat. No.	Description	No. of Pins	Canister	Lamps	Colour Code	List Price	Price Reduction
FS401	D.C. thermal	4 soldered	Normal	40w. 4'	Aluminium	6 -	4d.
F402	A.C. glow	4 soldered	Normal	30 40w.	Aluminium	4'6	No change
FS403	A.C. glow	2 soldered	Small	30 40w.	Aluminium	4 -	6d.
FS407	A.C. glow	2 soldered	Small	20w. on 100 250 v.	Aluminium	4/6	No change
FS601	D.C. thermal	4 soldered	Normal	80w. 5' & 40w. 2'	Aluminium	6/-	4d.
FS605	A.C. universal glow	4 soldered	Normal	30w., 40w., 80w.	Aluminium	5/-	1/4d.
S2000	A.C. double glow	4 soldered	Normal	Series pairs— 15w., 20w., 40w. 2'	Blue	6/-	4d.

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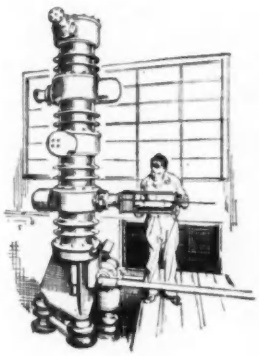

THIS IS AN AGE OF SPECIALISATION: and while the theoretical arguments against specialisation are legion, few can attack it on practical grounds.

In our own field of switchgear we came to no momentous decision to specialise. Rather it was events that decided for us. We found that electrical undertakings all over the world were in need of switchgear. We also found for a host of reasons that the making of safe and reliable switchgear was our strong suit. Ergo, we specialised.

And, specialising, we both attracted and created specialists, producing within the specialist macrocosm of switchgear a hundred-and-one specialist microcosms. On the 132 kV 3,500 MVA air-blast circuit breaker the performance achieved is the result of the integrated work of specialists on insulation, arc control, contact materials, air operating mechanisms and many other facets of modern switchgear.

Our primary concern is designing and producing switchgear, so if you have any transmission or control problems, why not talk to us.

If you want to talk: switchgear
. . . talk to Reyrolle

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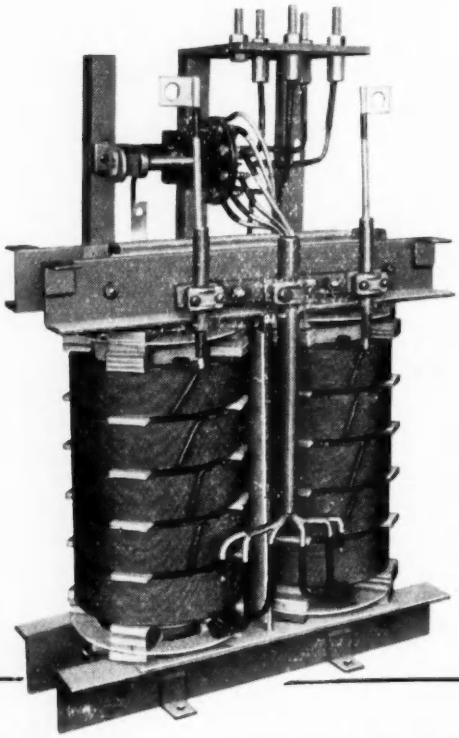
From cover to core–

The equipment illustrated is a 50 kVA 11,000/500 volt 50 cycles single phase, oil immersed naturally cooled platform mounting transformer forming part of an order supplied to the B.E.A. for rural power distribution.



Behind the outer casing of these units lies the results of over 45 years experience in the design and construction of over one million Power Transformers. Full information concerning our range of Test Equipment, Voltage Regulators and Transformers up to 3000 kVA and 66 kV will be sent upon request.

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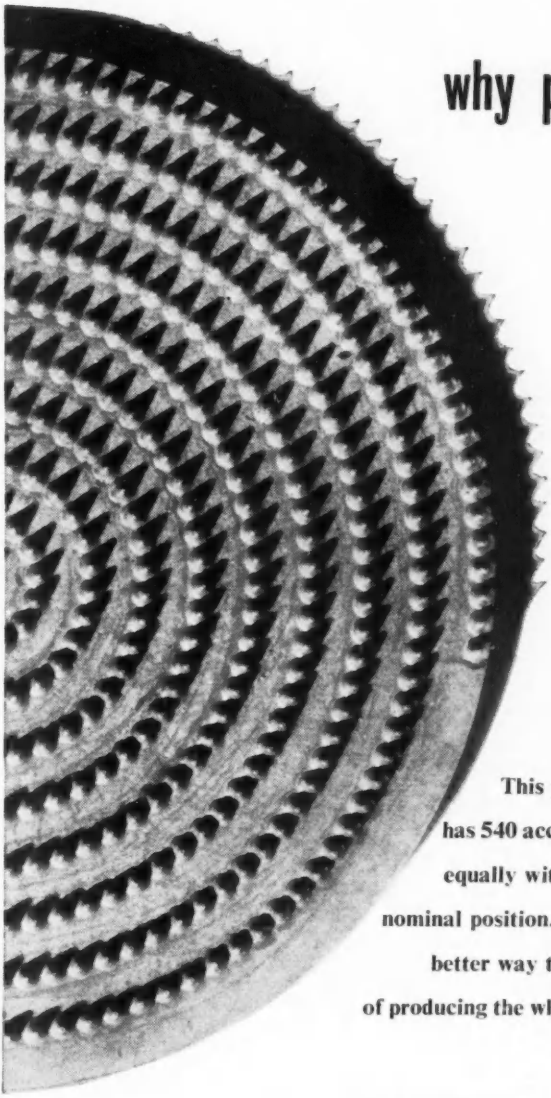

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This part for a potentiometer has 540 accurate projections spaced equally within limits of ± ·001″ of nominal position. Can *you* think of any better way than pressure die casting of producing the whole *in one operation?*

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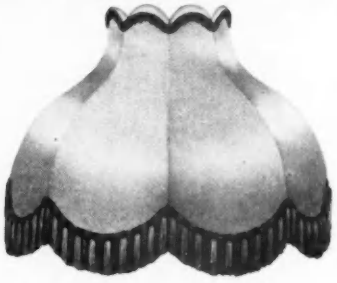
★ HIGHLY SUITABLE FOR EXPORT TO ALL CLIMATES

New illustrated list on application



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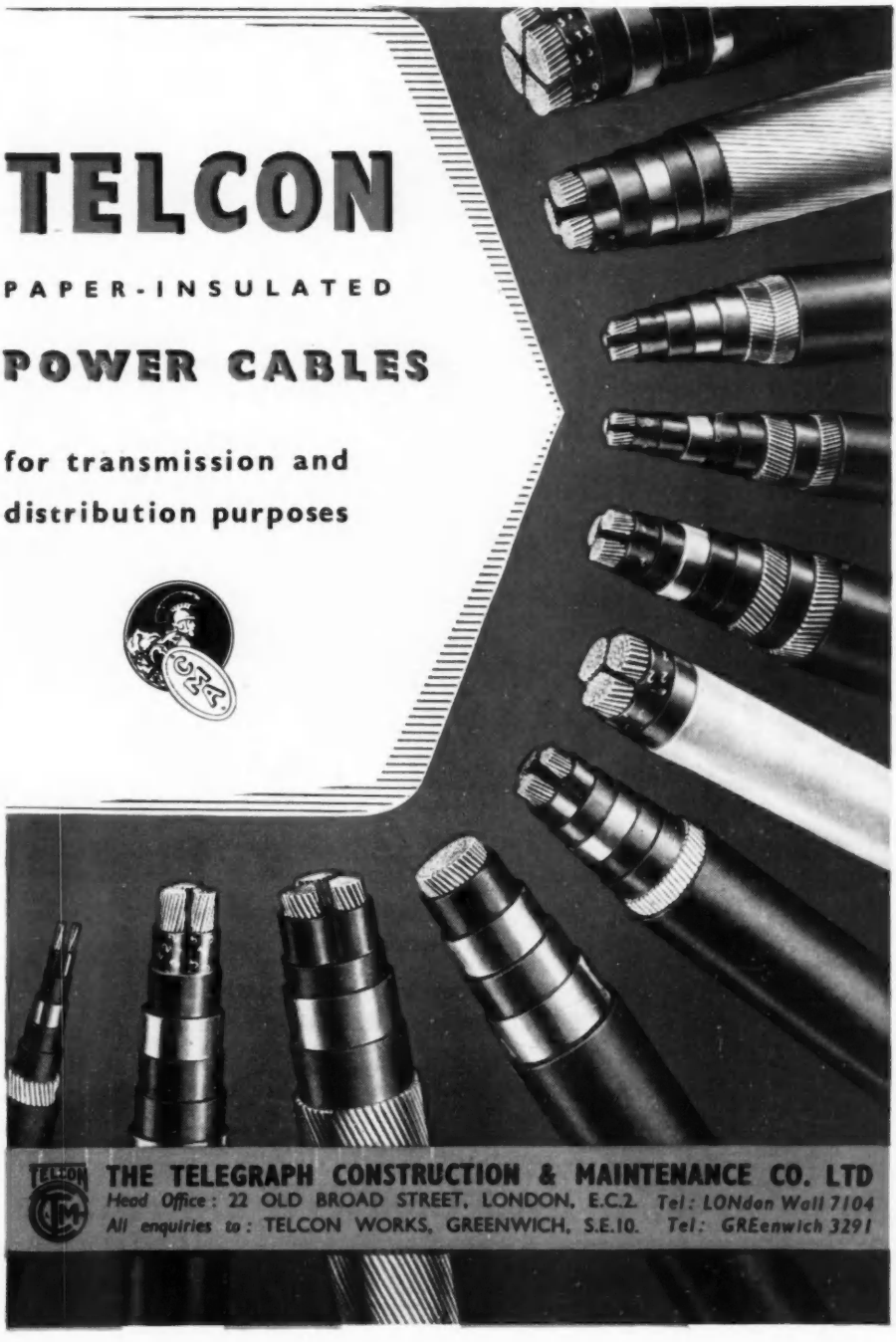

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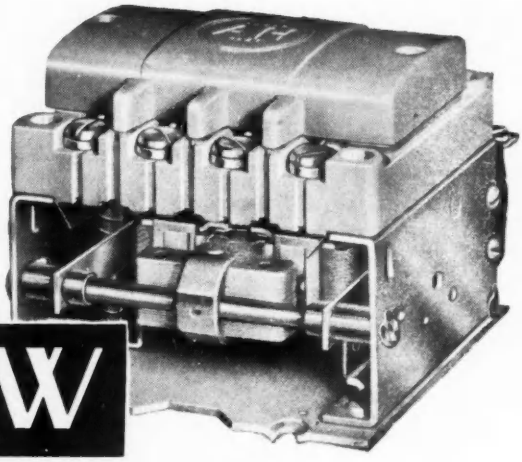

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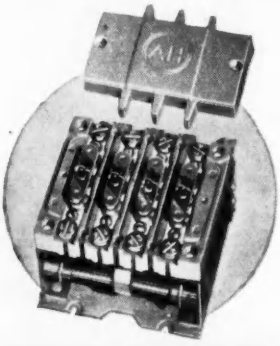

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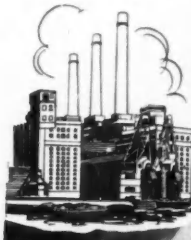

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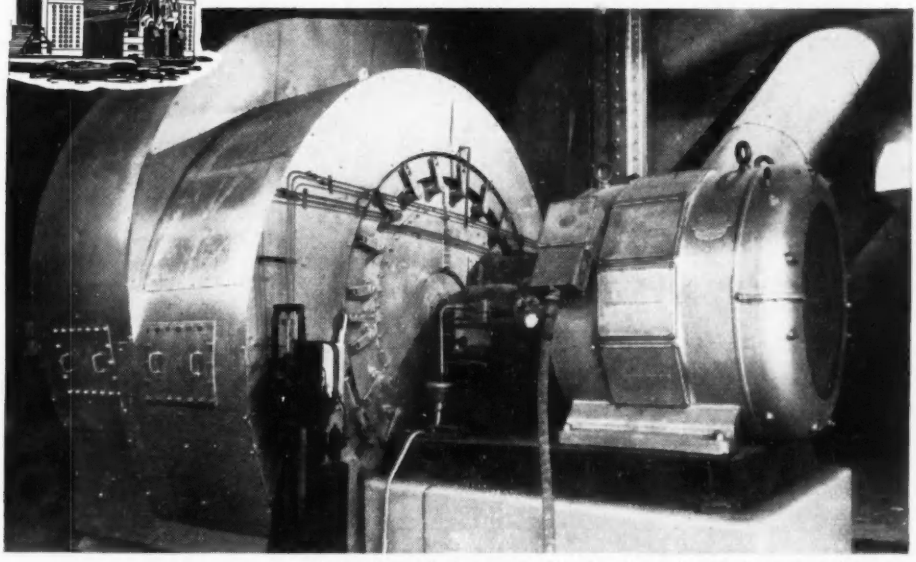

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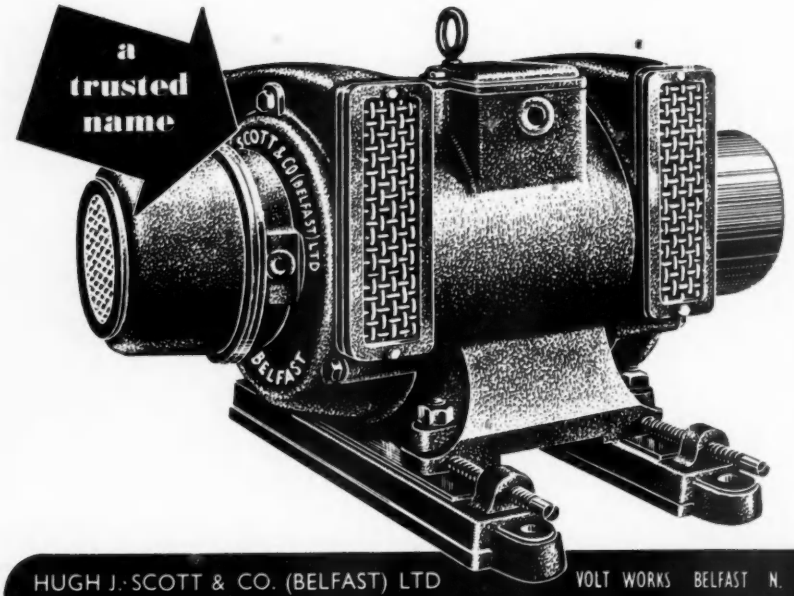

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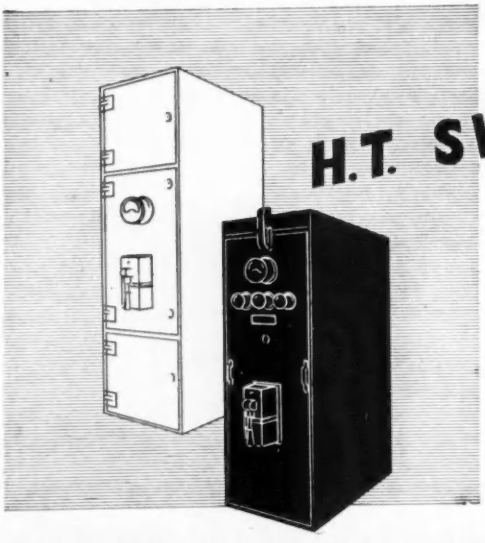

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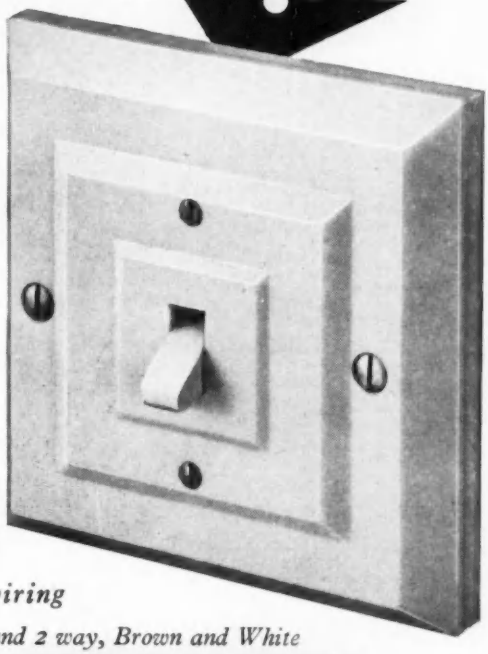

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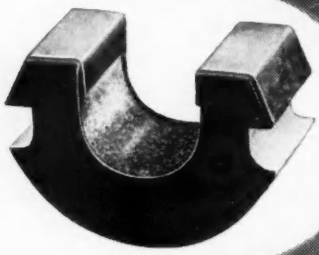

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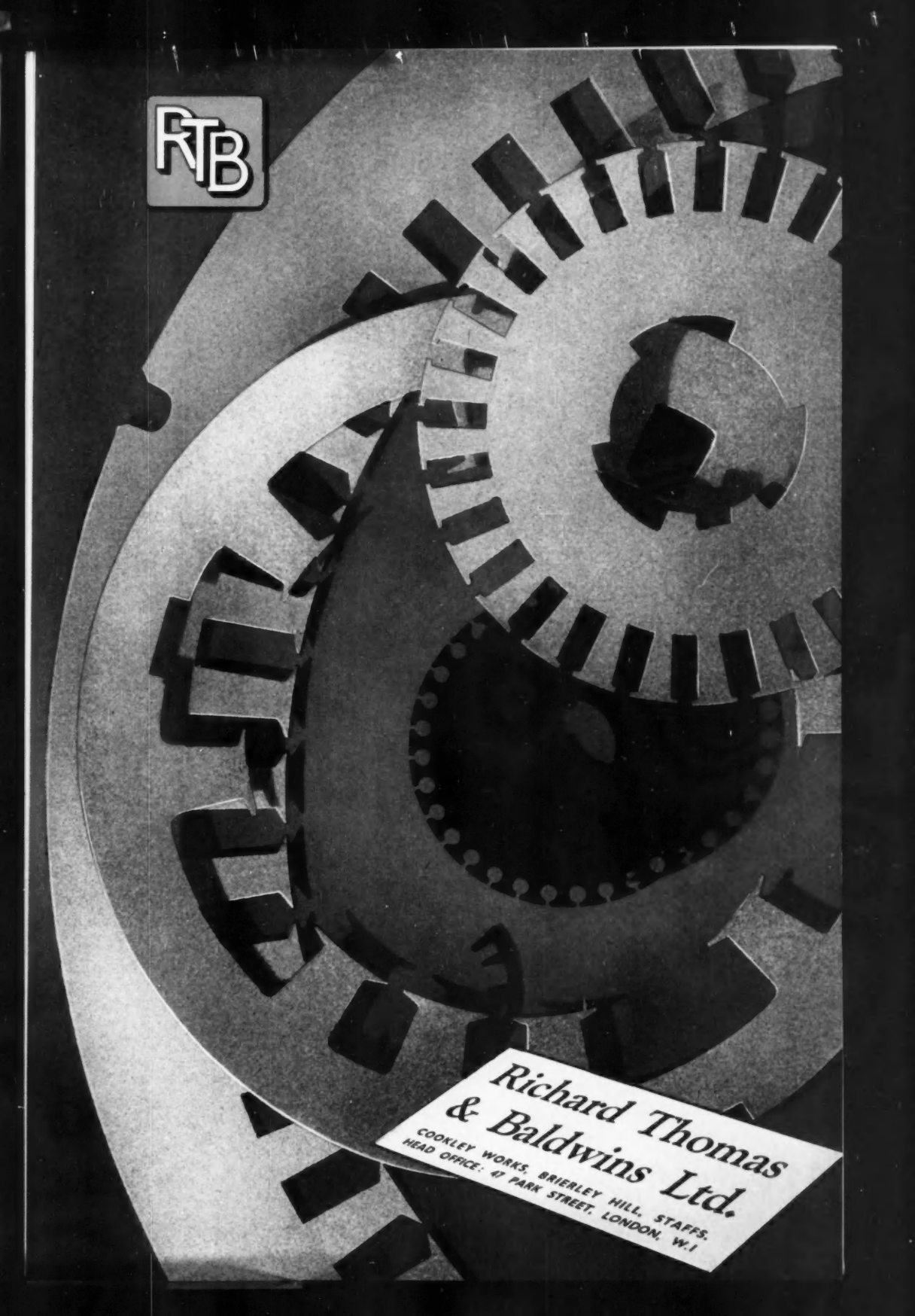
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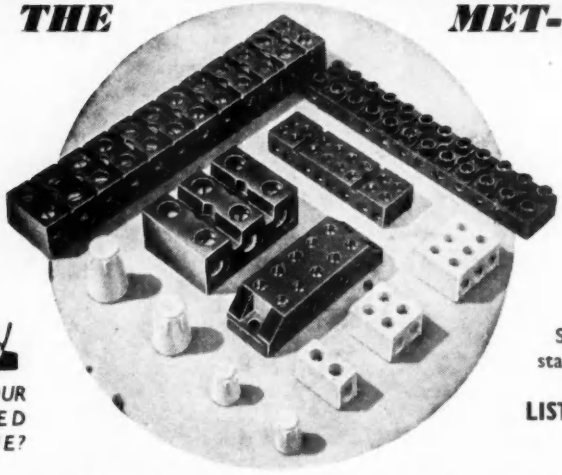

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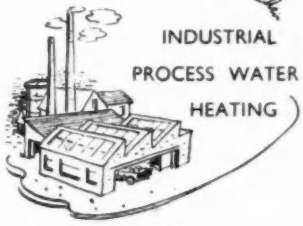

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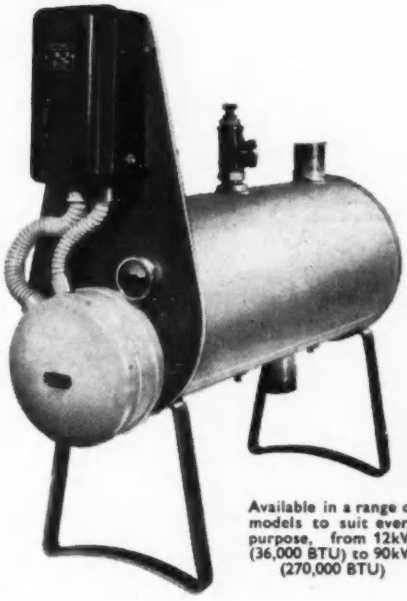

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ELECTRICAL TIMES

Vol. 122 No. 3177 THURSDAY, 25 SEPTEMBER, 1952

PUBLISHED EVERY THURSDAY

SIXTY-FIRST YEAR OF PUBLICATION

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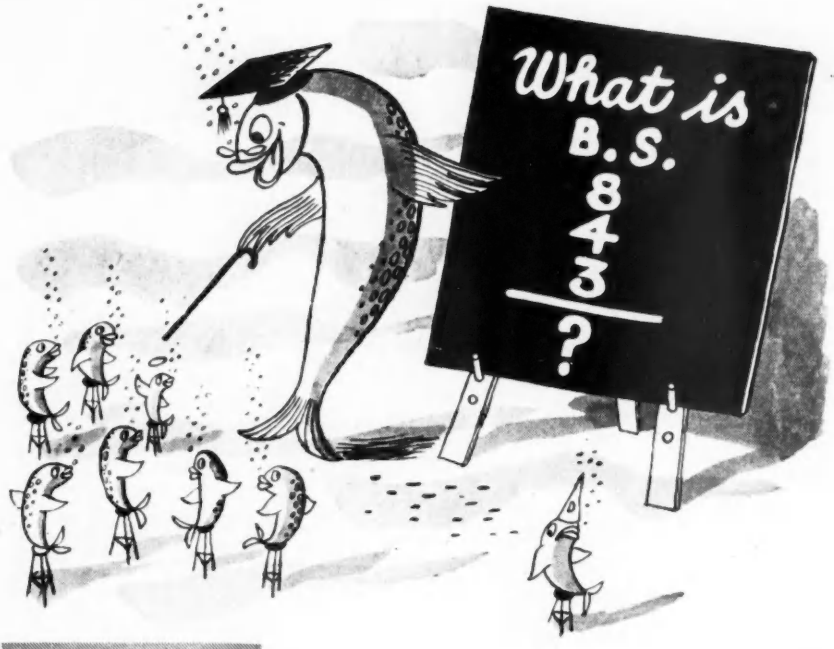

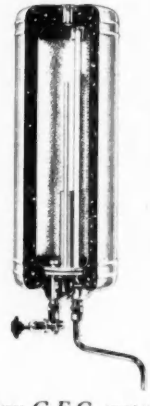

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Editorial

ACCESS ASSURED

FOR the electrical maintenance engineer the ingenuity of the machine tool designer in improving the appearance of his product, while keeping extreme accuracy of performance as the prime characteristic, has proved a mixed blessing. In passing from the stage of external motors and separate control panels to the streamlined effects noted by the Minister of Supply at the opening of the current International Machine Tool Exhibition, the problem of accessibility for maintenance seemed often to receive less than its just degree of consideration. Moreover, during this time electrical control gear was increasing in complexity, and electronic devices were making their appearance in industrial equipment. At this year's show, however, there is welcome evidence that frequent complaints at this apparent neglect have at last had their desired effect. Many manufacturers are able to point to special features in the housing and arrangement of the electric control gear and motors incorporated in their machines, as evidence of the thought that has been given to electrical maintenance requirements. By making things easier for the factory electrician in this way, they are really securing greater reliability for their products, and contributing more than ever to the smooth and efficient working of factories. This applies not only to absence from breakdown, but also to the greater safety in working that is likely to result when routine maintenance is facilitated.

B.E.A. COLLEGE

ONE of the less publicised achievements of the B.E.A. has been the setting up of an educational department tailor-made to the industry's own requirements. An appreciation of the work that has been done in this sphere was recently afforded us by a visit to one of the two residential centres that are maintained solely for staff of the supply industry. These centres have permitted for the first time additional training of manual staff, which is the largest group catered for, but in addition, a wide range of specialised courses have been held for all levels of staff. Of special interest to those concerned with the modern concept of management are the short courses for local advisory committee members. Too often, joint consultation in industry fails to achieve the desired results due to lack of proper understanding of its purpose by the committees concerned, and these courses are aimed at inculcating the right approach to problems arising at local levels. Such educational facilities are in the van of thoughts on modern industrial management. Possibly one of the greatest advantages of these centres lies in the club-like atmosphere which surrounds the residential course. Here staff from different sections of the industry and from all parts of the country can meet and discuss mutual problems informally, and this must have a substantial unifying effect on the heterogeneous nature of the industry which was the B.E.A.'s inheritance. Some four thousand staff have attended residential courses at the two centres and as this number increases it must provide a substantial leavening to the rest of the staff. Perhaps one weakness exists: the courses so far provided are predominantly divisional in character. There should be room for greater participation of area boards in this educational technique, so new to the industry.

SERIES LIGHTING

THE welcome presence of an American engineer as a speaker at this year's A.P.L.E. Conference prompted some discussion on the relative merits of the American practice of series connection for street lighting supplies and the conventional British

parallel system. Have we in this country been missing something in abstaining from constant current schemes of the series type? Some guidance on the point may be obtained from a glance at the history of public lighting in the United States. In the early days a system using the magnetite arc gained considerable popularity in America, where gas was little considered for this purpose. It was not unnatural that the complicated equipment necessary should be retained when the time came for a change to the filament lamp, especially as the constant current system had many advantages to offer. Principal amongst these were a greater luminous efficiency, and longer lamp life because of the controlled current and the stouter filament used. But as the basic reasons for the adoption of this system lie in the past, so do the advantages. Lighting technique has advanced beyond the filament lamp, and these considerations do not in general apply to discharge lamps in their various forms, while the method is quite unsuitable when high-pressure mercury vapour lamps are employed. On balance it would appear that the Americans may have a liability on their hands with respect to future illumination developments, and that this outweighs any present advantages of the series system where tungsten filament lamps are still in use.

RAILWAYS AND FUEL

SUBSTANTIAL improvements in fuel utilisation efficiency on the part of the railways can come about principally by full electrification, or by a change to oil-burning diesel (or perhaps gas-turbine) locomotives using electric transmission. This old claim was naturally considered, and endorsed, by the Ridley Committee, and it has now been taken up again by Mr. C. M. Cock in his presidential address to the Institution of Locomotive Engineers. It is reassuring to find that in both these cases similar conclusions and estimates are reached in regard to several important points. Electrification, it is estimated, would result in a thermal efficiency from coal of more than double that at present achieved, while if oil is used in internal combustion engines on some lines, in connection with electric drives, the improvement possible should be of the same order. In answer to the strategic bogy often raised when a change to oil is suggested, Mr. Cock places the requirements for even a complete change over as low as 5·5% of total imports of this fuel. The Committee supports this point with emphasis on the existing complete dependence on oil in many fields of first importance in time of war. Finally, there is agreement from both sources that despite capital difficulties, a start should be made very soon in the change from steam traction, and that existing schemes of the Railway Executive probably do not go far enough in this desirable direction.

TRACTION SUPPLY

IN his detailed consideration of possible substitutes for the steam locomotive, Mr. Cock gives attention to the use of single-phase 50 c/s supplies for railway electrification. In spite of the success of continental experiments with this system and its great advantages of flexibility in terms of links with the public-supply system, he is far from optimistic concerning its extended use in this country. The most weighty argument presented against this is the difficulty that may be caused by the unbalanced load presented to the three-phase grid system. In this country, with its frequent junctions on main lines, the difficulty might be specially pronounced. Other factors such as the small headroom available in existing tunnels for line conductors at 20 kV or so are considered to combine with the main objection to outweigh the advantages that such a method of working can offer. The present British tests at Morecambe and the outcome of further French experience will be closely watched to see whether this is so, while there is promise of further data from an American report which advocates a 24 kV, 60 c/s single-phase contact system, with static conversion from three-phase to single-phase at substations.

D.C. Shunt Motors driving Variable Speed Loads

EFFECTS OF SIMULTANEOUS USE OF ARMATURE AND FIELD CONTROL

By R. WELLS, A.M.I.E.E.

IN a previous article* the subject of d.c. shunt motors driving variable speed loads was dealt with on the basis of the speed increase from zero to base value being obtained by increasing the armature voltage with the field current held constant at full value, and with speeds above the base value obtained by decreasing the field current with the armature voltage held constant at full value. This method of speed control, in which only one of the controlling quantities is varied at a time, is the usual one employed for the purpose. It is possible, however, to use a simultaneous variation of the controlling quantities, and to obtain speed increase with an increase of armature voltage taking place at the same time as a decrease of field current, and to obtain speed decrease vice versa.

It is proposed then to deal with this mode of speed control for the particular case of a variation of armature voltage from 40% of full value to 100% of full value, taking place at the same time as a variation in field current from 100% of full value to 40% of full value.

The present article is written as a companion to the original, within the same scope, with the same assumption of an ideal motor, and considering the same four types of load. By this means it is possible to make a fair comparison between the two methods.

Basis of Presentation

As before, a graph has been prepared for each of the four types of load, with the quantities which affect the motor speed (armature voltage and field current) used as a double abscissa and on a percentage-of-base-value scale. This abscissa, of course, looks quite different to that used for the original graphs and it is by studying them in comparison that the difference between the two modes of control is best understood. The right-hand ordinate has been used to show the r.p.m. on a percentage-of-base-value scale so that 70% armature voltage and 70% field current produce 100% r.p.m. as would 100% armature voltage and 100% field current if they were coincident.

In the original article the whole range of armature voltage from zero to 100%, and the whole range of field current from 100% to zero were considered, and since this produces the full speed range from zero to infinity, it was only possible to use a comparative scale for the load-dependent quantities of torque, horse power, and armature current. Now in the present case the r.p.m. range is of the finite extent from 40% to 250% and this makes it possible to show fully the corresponding variation of the load-dependent quantities on a true percentage scale, provided that we treat their maximum values as being 100%. This has been done on the left-hand ordinate. It will be noted that r.p.m. has been shown on this scale as well as on the right-hand ordinate; so that if the percentage r.p.m. referred to top speed is required the r.p.m. curve should be read against the left-hand ordinate; while if the percentage r.p.m. referred to base speed is required the r.p.m. curve should be read against the right-hand ordinate.

It will be noted that on each graph there has been shown a shaded area beneath the armature current curve. The lower edge of this shaded area corresponds to the curve for armature current as it would be had the conventional method of speed control been used. For example, on Fig. 1 it will be seen that 60% armature voltage and 80% field current produce 75% r.p.m., and that the armature current has a value of 167% at this point. Now with conventional control 75% r.p.m. is obtained when the armature voltage has a value of 75% and the field current has a value of 100%. Taking the relevant graph (Fig. 1) in the original article it will be seen that the armature current at this point has a value of 133% and it is this value which is given by the lower edge of the shaded area at the point concerned. This difference of armature current is, of course, brought about because whereas the horse power is the same, the armature voltage is

* *Electrical Times, April 17, 1952.*

SYMBOLS USED IN ARTICLE

N = Speed of rotation (r.p.m.) expressed as a percentage of full nominal value.
E = Armature voltage expressed as a percentage of full nominal value.
I_F = Field current expressed as a percentage of full nominal value. Note that the useful flux per pole is strictly proportional to I_F.
T = Torque expressed as a percentage of full nominal value.
H.P. = Horse power value expressed as a percentage of full nominal value.
I_A = Armature current expressed as a percentage of full nominal value.

different and in the example given 133% times $\frac{75\%}{60\%}$ equals 167%. It will be appreciated that all values given in the foregoing example are base values because only base values were used originally and because in any case armature voltage and field current are expressed as such. This makes it necessary to read armature currents against the right-hand ordinate of the present graph for the purpose of this example.

Detailed Consideration

It is now proposed to consider each case in detail. For the first case, consider load torque varying inversely as speed so that horse power is constant (see Fig. 1).

The graph is constructed by plotting the speed curve against the base value ordinate from $N = \frac{E}{I_F}$. (Symbols used are given in the table.)

Now, since it is required to show torque, horse power, and armature current as having maximum values of 100%, and since it is known that with this type of load the maximum values of these quantities occur at minimum speed, all three curves must start at 100% on the left-hand ordinate.

The horse power line may be drawn then at a constant value of 100%. The torque line may now be plotted proportional to $\frac{H.P.}{N}$ and then the armature current line may be plotted proportional to $\frac{T}{I_F}$.

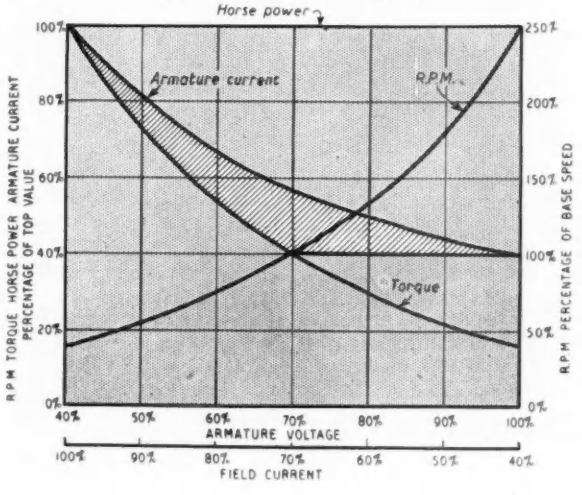
It will be noted that whereas the speed curve shown originally for conventional control was in two distinct parts with a point of inflexion at 100% value, the speed curve is now smooth throughout—starting at 40% of base value, passing through 100% value where armature voltage and field current are of the same percentage value, and finishing at 250% of base value. The torque curve is once again a mirror image of the speed curve due to the constant horse power load.

Armature Current

The armature current curve starts and finishes at the same values that would obtain if conventional control were used—due to the fact that both armature voltage and field current start and finish at the same value that they would have with conventional control used over the same speed range. As explained previously, the armature current is higher at all intermediate points, and it is of interest to note that the lower edge of the shaded area (which represents the armature current curve as it would be) is associated with the torque line up to 100% speed and with the horse power line thereafter, as was the case originally. It remains true that with this mode of control, as with the conventional mode, this type of load is best driven by confining speed regulation to the field-current control range.

The second case considers load torque constant and independent of speed (see Fig. 2). The speed curve plotted as before.

Fig. 1.—Variation of electrical and mechanical quantities for a shunt motor when load torque varies inversely as the speed (that is, constant horse power)



Now in this case torque, horse power, and armature current will have maximum values at maximum speed so that all three curves will finish at 100% read against the left-hand ordinate. The torque line may be drawn then at a constant value of 100%.

The horse power curve may now be plotted so as to be proportional to $T \times N$, and the armature current plotted to be proportional to $\frac{T}{I_F}$. The horse power curve is identical with the speed curve (as it was originally) due to the torque being constant.

The armature current curve is the reverse of case 1, but the same remarks may be made in reference to it, both as regards the values as they now apply and as regards the values as they would be for conventional control.

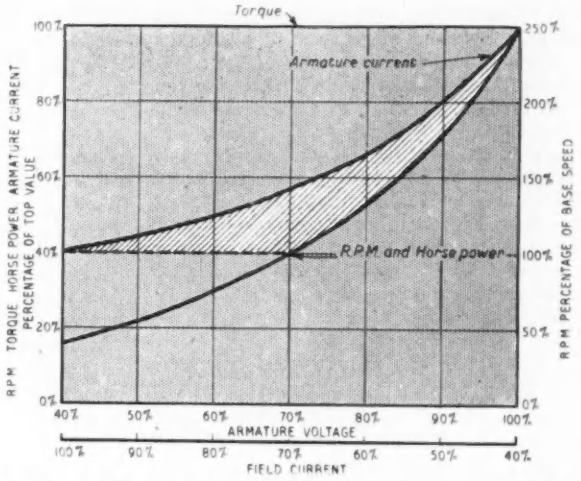


Fig. 2. Variation of characteristics for a shunt motor when torque is constant (h.p. varies directly as speed)

With load torque varying directly as speed (see Fig. 3), the third case, the speed curve is plotted as before.

Again, with this type of load, torque, horse power, and armature current will have maximum values at maximum speed, and again all three curves must finish at 100% value. The torque curve is identical to the speed curve owing to the type of load.

The horse power curve is now plotted to be proportional to $T \times N$, and the armature current to be proportional to $\frac{T}{T_F}$.

The horse power curve is, of course, the square of the common speed/torque curve as originally.

In general, the same remarks may be made in connection with the armature current curve both as it now applies and as it would be with conventional control, but it will be seen that owing to the nature of the load there is not so much difference between the two curves in this case as there is for the two previous cases.

Finally, for load torque varying as $(\text{speed})^2$ (See Fig. 4), the speed curve is again plotted as before.

Once more, with this type of load, torque, horse power, and armature current will have maximum values at maximum speed, and once more all three curves must finish at 100% value.

The torque curve may now be plotted to be the square of the speed curve as this is the characteristic of the load.

The horse power curve is next plotted to be proportional to $T \times N$, and the armature current curve to be proportional to $\frac{T}{I_F}$. The horse power curve in this case becomes proportional to $(\text{speed})^3$.

As far as armature current is concerned, it is only necessary to note that the difference in values of the curve as it now applies, and as it would apply, are now very small.

General Comparison

There is no advantage to be claimed for the method of speed control here presented except when it comes to arranging the controls. The fact that with this method of control the armature current has a greater value at intermediate speeds than it would normally have is not necessarily a disadvantage. This is so because the current does not in any case, or at any value of speed, exceed the maximum value it would have with the conventional control method so that the kW rating of the supply apparatus is not increased (for any particular application) by the use of this control method. Further, of course, since the higher intermediate armature currents are taken at a correspondingly lower armature voltage, the actual kW output required from the supply apparatus is the same for all types of load, and at all speeds.

The only disadvantage in the use of this method occurs when a grid-controlled mercury

arc rectifier is used, as the means of supplying the armature (the method of supplying the field may be neglected because of the much smaller power involved) as in this case the lower armature voltage required to attain a particular speed when driving a particular load means that the rectifier would be working at larger angles of anode firing delay and hence at lower power factors. It will be noted that even this disadvantage becomes less serious for the case where the horse power varies as the $(\text{speed})^2$—(Fig. 3), and it becomes negligible where the horse power varies as the $(\text{speed})^3$—(Fig. 4).

Problem of Unified Speed Control

As originally explained, the variable voltage supply for the armature may be obtained from a Ward-Leonard set or from a variable voltage rectifier. The field current may be controlled by means of a shunt regulator (using a constant voltage supply), or again the field may be supplied from a separate variable voltage supply in which case a shunt regulator would not be used.

It will be appreciated then that although any combination of the above alternative methods may be used to provide controllable armature and field supplies, there will inevitably arise the problem of unifying the two controls (it not being satisfactory to provide two separate and independent controls) in such a way that field current control follows on smoothly and properly from armature voltage control for increasing speeds and vice versa when speeds are to be decreased.

In the case where the variable voltage armature supply is obtained from a Ward-Leonard set and the control of the field current is obtained by means of a shunt regulator, the problem can be solved fairly simply by using two ganged regulators (one for the field of the Ward-Leonard set and hence for the armature voltage of the shunt motor—and one as the shunt regulator of the motor itself), the first having an ineffective section where the armature voltage is held constant and the second having an ineffective section where the field current is held constant.

This difficulty is not always so easily overcome as in the case mentioned above, and the problem of unifying the controls can take many forms because it depends not only upon the broad issues already outlined but on such details and variations as follows.

The actual control means may be by simple handwheel, or it may be motorised and by means of push buttons, or an automatic servo system may be employed. Further, if a variable voltage rectifier is used to supply the motor armature and/or its field, the voltage variation may be achieved either by variable anode voltage using such well-known and stepless methods as induction regulator or sliding contact transformer, or it may be achieved by grid control. Again, if grid control is used the actual variation of anode firing delay may be achieved by machine type phase shifter, by electronic or transductor controlled phase shifting network, or by bias control.

This problem has been solved satisfactorily by various ingenious means and in one case within the author's experience, where grid controlled rectifiers were used for both armature and field supplies, the two machine type phase shifters were so coupled that not only did field current control follow on from armature voltage control but compensation for the cosine relationship between rectifier output voltage and angle of anode firing delay was obtained to give a linear relationship between the angular movement of the common phase shifter driving shaft and the speed (r.p.m.) of the main motor.

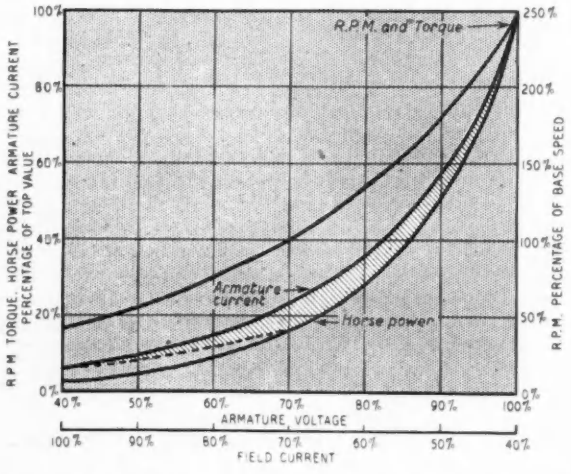


Fig. 3.—Variation of characteristics for a shunt motor when torque varies directly as the speed (h.p. varies as square of speed)

Control Simplification

It will be appreciated that the problem outlined above can be eased by adopting the method of speed regulation which is now being discussed. One reason for this is that by using simultaneous variation of armature voltage and field current, "follow on" of the controls is not called for. For example, even with the simple case of a Ward-Leonard set for the armature and a shunt regulator for the field, it would not be necessary for each of the ganged regulators to have an ineffective section. In a similar way, if two grid-controlled mercury arc rectifiers with machine-type phase shifters were used, the mechanical arrangements for rotating the phase shifters would be considerably simplified. It is in ways similar to the foregoing that the method of simultaneous variation shows its advantages and it is a system worthy of consideration in many cases.

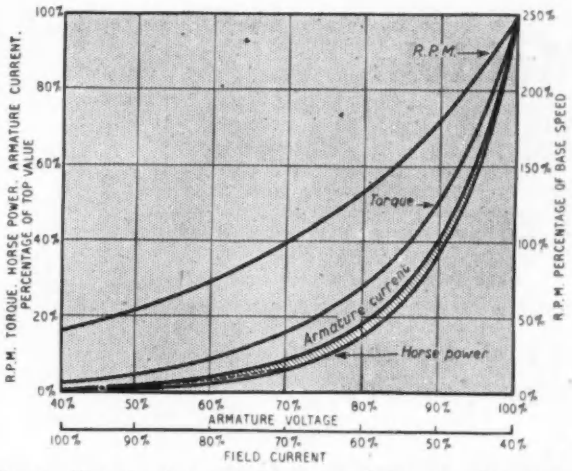


Fig. 4.—Variation of characteristics for a shunt motor when torque varies as square of speed (horse power varies as the cube of speed)

Effect of Range

When deciding over what range the controlling quantities shall vary the following points must be given consideration.

It would not do to arrange for variation of armature voltage from zero to 100% to correspond with variation of field current from 100% to zero as this would result in the top speed tending to infinity. It is possible, however, to make use of the fact that in many practical cases it is *not required* for the armature voltage to go down to zero, and of the fact that the field current *must not* go down to zero, to provide an offset arrangement as used by way of example in this article.

The amount of offset used (40% in the example) decides the voltage which will be applied to the armature for starting purposes, it also decides the minimum and maximum speeds and therefore the actual speed range. It becomes necessary then to compromise when deciding what amount of offset to use for the reason that whereas no offset gives easy starting conditions, the top speed tends to infinity, while a large offset will give starting conditions which are too violent but it will give a low top speed. The example used gives a speed range of 6·25 to 1 and a starting voltage which represents about the maximum allowable.

It is not essential, however, that the simultaneous variations of armature voltage and field current should take place with the same percentage change, and a good deal of the benefit to be derived from this mode of control will still be retained if it is arranged for, say, a change of armature voltage from 10% to 100% to correspond to a decrease of field current from 100% to 40%. By such means as this, it is possible to obtain a suitable armature voltage for starting purposes, and the required speed range, while at the same time easing the problem of unifying the controls.

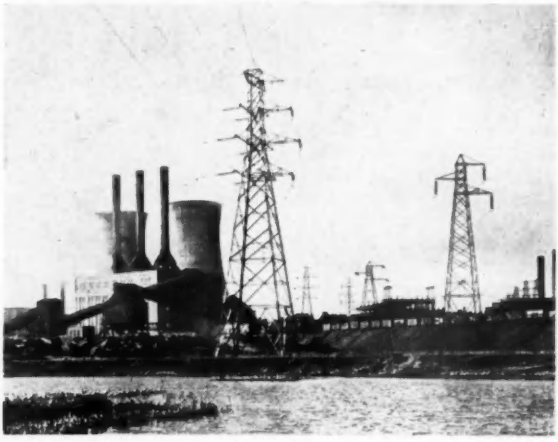
BALL BEARING TROUBLES

TROUBLE with the relatively short life of ball as compared with sleeve bearings on continuously operating motors has led to a special investigation of the problem in the United States. Sponsored by the Edison Electric Institute, this has taken special account of the difficulties introduced in generating stations. As a result of a questionnaire circulated to some 71 companies with 40,000 motors, it was concluded that ball bearings had a life under continuous operation of five to seven years, as compared with 11 to 16 years for sleeve bearings. Moreover, sleeve bearings generally gave more adequate warning of failure than ball bearings.

Further statements made were that ball bearings were subject to many more lubrication troubles than sleeve bearings. They were not suitable for spare or idle motors in turbine areas subject to double frequency vibration. It was recognised, however, that industrialists generally preferred the ball bearing.

Multiple Tower Types

Short 132 kV line uses most of the standard designs of structure



THE 132 kV overhead line, which has recently been installed by British Insulated Callender's Construction Co., for the Midlands Division of the British Electricity Authority from a point near Ocker Hill power station to Oldbury substation, traverses some very difficult country.

The line forms a loop off one of the circuits of a double circuit line from Ocker Hill to Nechells, the loop running to Oldbury to supply a new substation there. Possibly there are other lines which have been built in the face of more serious obstacles, but this line, which was planned and wayleaved by the Midlands Divisional Staff, is probably unique in the number and variety of the obstacles which had to be overcome in such a short route length. Though it is only 3½ miles long, it is located in the heavily industrialised Black Country, and in the course of its short run it crosses five railways, nine canals, eight roads, two power lines, a deeply flooded clay pit as well as a number of buildings.

SCHEDULE OF TYPES OF TOWERS USED ON OCKER HILL-OLDBURY 132 kV GRID LINE

Type of tower	Ref. No. of towers for single earth wire construction	Ref. No. of towers for double earth wire construction
Intermediate tower	D.2(S) D.2(S) E.30	DD.2(S) E.10 DD.2(S) E.20 DD.2(S) E.30
10° angle tower	D.10 D.10 E.30	
30° angle tower	D.30	DD.30 DD.30 E.30
60° angle tower	D.60 E.20	DD.60 E.10
90° angle tower	D.90 E.20	DD.90 E.10 DD.90
Terminal tower		DD.T
Change-over from single to double earth wire	DD.30 change-over	DD.30 E.30 change-over
Special junction for connecting looped branch line to main line		Special

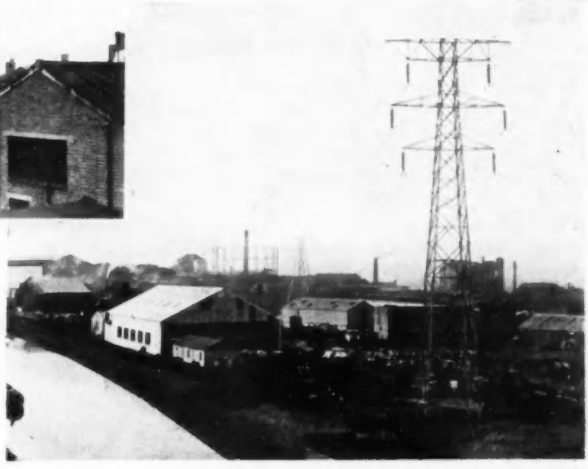
Tower Sites

The towers had to be sited in some most unusual situations and a large proportion of the foundations are in made-up ground such as old dirt tips and abandoned brickyards. Among the sites used are gardens, allotments, a marshalling yard and a steel yard. The difficulty of finding suitable sites for towers and the obstructions met with necessitated many changes in the direction of the line. The longest straight run on the line comprised only four spans and of the 25 towers, 13 are angle-type towers. All the towers except six have extensions of from 10 to 30 feet.

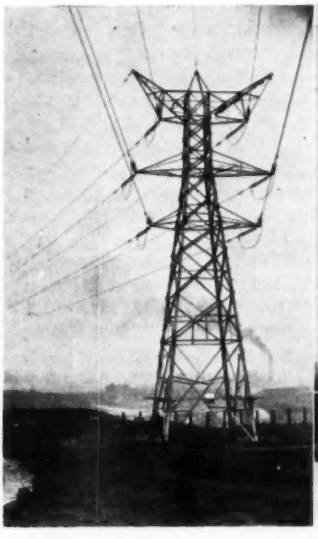
There were 19 different varieties of foundations. The types of towers which were used are listed in the accompanying schedule, and it is interesting to note that they comprise almost the complete range of the up-to-date types of towers in use on the 132 kV British Grid.

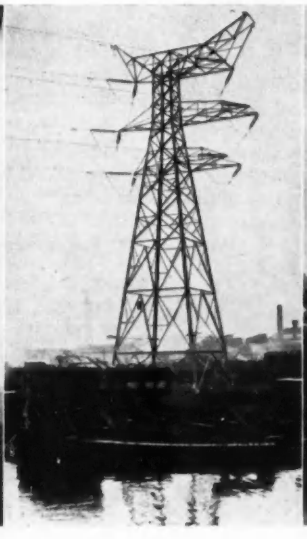
The wayleaving and surveying of this line was naturally fraught with a good many difficulties. Survey sighting was effected from a church tower and a gas holder amongst other unusual places, and even when all the preliminary survey work had been carried out, the final lining-in took nearly four weeks to complete. A number of problems were encountered in getting materials to some of the rather unusual tower sites and special arrangements for running the conductors had to be made over the greater part of the route.

The special tower at the junction of Ocker Hill–Oldbury and Ocker Hill–Nechells line is seen in our heading picture. Then an intermediate type tower with single earth wire (left) and 30 ft extension, on the section of line crossing the High Street at Great Bridge leads to another intermediate type tower with double earth wire and 20 ft extension on the section of line crossing the Limmer Trinidad Lake Asphalt Co's yard



At the foot of the page is seen a 30° angle tower at the point of change-over from double to single earth wire construction with next a 90° angle tower with double earth wire and 10 ft extension erected in Oldbury marshalling yard and finally, bottom right, the terminal tower at Oldbury substation





Our readers' views . . .

European Power Committee

YOUR issue of August 21, 1952, has just reached this part of the world and I was interested to read your leading editorial on the participation of the U.K. in the work of the Committee on Electric Power of the Economic Commission for Europe in Geneva.

It is a pity that the excellent article on the work of the Committee on page 315 should be spoiled by attributing credit for the formation of this Committee to UNESCO. The Committee stems from a much older body which was created by a small group of engineers during the closing stages of the war when Col. Walker Cisler of the U.S. forces, Monsieur Ailleret of France, Monsieur de Heem of Belgium, Mynheer Bakker of Holland, Mr. Bodson of Luxembourg and myself constituted an informal gathering which later developed into what became known as the Public Utilities Panel. This group did invaluable work during the first two years of reconstruction and foresaw the need for some continuing organisation.

A drafting committee which included Monsieur Etienne of Switzerland was set up as a result of which a recommendation went to the Devastated Areas Sub-Commission of the United Nations that a Power Division should form part of any body created by the United Nations to assist in the economic reconstruction of Europe. I was invited to become the first Director of this Division on the formation of the Economic Commission for Europe, and served in that capacity until 1950.

The support given to the Committee by the majority of European nations, including many of those now behind the iron curtain, was enthusiastic. The part played by the United Kingdom, however, was not as prominent as its eminence in the field of electricity supply warranted, and it is to be hoped that your appeal for greater co-operation will be fruitful.

J. Houston Angus (Chairman)

ELECTRICITY CORPORATION OF NIGERIA, IJORA, LAGOS.

Static on Cars

I HAVE read the correspondence on the above subject with considerable interest. In South Africa, and no doubt in all similar hot, dry climates, this phenomenon is of frequent occurrence, but is more noticeable when the weather is dry (not necessarily hot) than at other times. The noise of a spark can frequently be heard at the same time as the shock is felt, which is generally when getting out of the car. At one time I assumed that the car became charged up owing to the frictional effect of the dry air on the body of the car, but I was surprised to experience a shock one day last summer on grasping the door handle of my car after it had been parked in a city street in the hot sun for about two hours. I, therefore, assume that in this case the car, being an insulated body, had become electrified by induction owing to the presence above it of a charged body of the atmosphere (perhaps a "cloud" of dust, which is often present).

This effect is described in an excellent book by Dr. B. F. J. Schonland, *The Flight of Thunderbolts*, where he refers to the charges which may be acquired by insulated objects on the ground during the passage overhead of charged clouds.

F. J. Halligey

WORCESTER, C.P., SOUTH AFRICA

WHILST by no means claiming to be an authority on the above subject, I should like to support the theory of your correspondent, Mr. E. A. Robbins (ELECTRICAL TIMES, July 31, 1952), regarding one cause for the appearance of static charges on cars.

The winter months in Southern Rhodesia are marked by a total absence of rain over almost the whole of the Colony, resulting in a very low humidity, and thus conditions are ideal for the investigation of static charges.

In the past at this time of year I had noticed that when *sliding* across the front seat of my car to close the near-side window or lock the door, a shock was obtained when making contact with the metal handle.

I thus conducted a few elementary experiments and determined, to my own satisfaction at any rate, that no shock was received if I *leant* carefully across the car without sliding and then performed the required operation. Any subsequent sliding action found necessary produced no shock providing always that I remained at the same potential as the car by maintaining a firm grip of the handle.

H. V. Kerrich-Walker

SALISBURY, SOUTHERN RHODESIA

Machine Tools *and* MAINTENANCE

Models shown at the International Machine Tool Exhibition show consideration of Factory Electrical Engineers' Problems

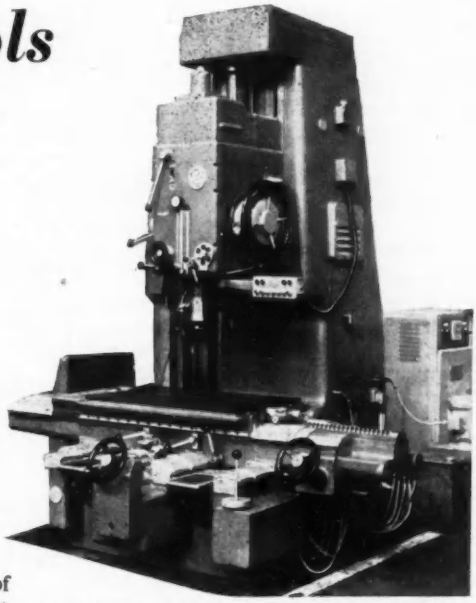
TO many electrical maintenance engineers the electrical equipment of machines they keep working seems to have been added as an afterthought, and they are convinced that little attention has been given to their special problems. The historical reasons for this impression were discussed in an article in the ELECTRICAL TIMES of July 17, and a review was given of trends in design which showed the live appreciation of electrical factors now apparent in the machine tool industry. This claim for an improvement is well substantiated in the current International Machine Tool Exhibition, which is being staged at Olympia.

As an example of the approach being adopted the Churchill Machine Tool Co.'s "PAW" 10 in. by 24 in. universal grinding machine may be considered. The controls of this are built into a box form apron bolting directly on to the front of the machine body, and electrical and mechanical controls are built up as a standard unit. Machined faces are used for the covers of the housings, so that oil and suds are kept away from the electrical equipment, while ready access is assured.

For internal wiring on the machine, p.v.c. oil resisting type cables are used, full advantage being taken of the wide range of colours possible for identification purposes. Care is taken to provide extra protection in the form of p.v.c. sheathing wherever abrasion is possible.

Cable Identification

The main control panel is built into the side of the machine beneath the suds tray. It is mounted on a special draw out type angle iron framework so that it can be readily removed for maintenance without the need for disconnecting any cabling. A special feature of this machine is the provision of a separate generator to supply the 6:1 speed range work head motor. This generator is driven by the table traverse motor, and compensated to give the characteristic required. It has the advantage of being more readily understood by maintenance personnel than is electronic equipment.



This Newall jig borer has control gear and supply rectifier in a separate panel at the rear

Stator and Rotor

An example of the use of stator and rotor unit on machine tools is given by the model VB universal grinding head. This is driven by a 1¾ h.p. 3,000 r.p.m. s.c. unit, which is built into the swivelling head to form a totally enclosed construction. The rotor is mounted directly on the grinding wheel spindle, and the whole assembly is dynamically balanced. Preloaded precision ball bearings are used. Another feature of this machine is an electro-magnetic brake, used to lock the cross-slide in its selected position. Control gear for the three motors of this machine is contained in a single dust-proof assembly mounted on the back of the pedestal, and provided with its own isolating switch. Each motor has three overload releases.

In a heavy duty horizontal miller manufactured by Adcock and Shipley, automatic star-delta starting equipment (Crabtree) is mounted in the side of the main column, covered by a large door to ensure easy and convenient access. A motor ammeter is included

amongst the standard controls. A vertical milling machine of the same firm incorporates electric limit switches for all motions, the switches being specially designed to avoid trouble from coolant and swarf. The control gear, mounted in the column, is carried on slides so that it can be drawn clear for maintenance. A standard foot-mounted motor is used for the main drive.

Arm-mounting

To make switchgear readily accessible, the Ajax Machine Tool Co., Ltd., has built its control equipment for a radial drill into the arm of the machine, and taken mains cabling back to the pillar base for easy connection. Special motors are used to meet the arduous duty requirements of repeated reversals. In the presses manufactured by E. W. Bliss (England), Ltd., automatic trip mechanisms involving micro-switches and solenoids are used to stop the machine should any jams occur in feeding.

David Brown Machine Tools, Ltd., mount the control gear of their gear hobbing machine at a convenient height at the side of the column or with the push-button panel incorporated. The main 10-h.p. motor is solidly carried on the base of the machine, and drives through multiple vee-belts. A headstock control panel is arranged in the Churchill-Redman 14 in. by 60 in. hydraulic profiling lathe, while contactor gear (Igranic) is placed behind a panel on the side of the machine. An ammeter is provided as a check of motor loading. A 14 in. by 20 in. lathe made by this firm has its main 5 h.p. driving motor (Brook) mounted in the headstock leg, with an interlocked switch on the main cover. Contactor gear is mounted in a separate compartment in the rear of the headstock leg.

A helpful method of incorporating electronic gear is shown in the Central Tool and Equipment Co.'s production type milling machine. This has continuous speed control from 100 to 2,800 r.p.m., and the drive characteristics are controlled by electronic equipment mounted in a pull-out drawer at the rear of the machine base. The motor is accessible behind a louvred panel in the side of the base, and the whole machine is fed through a mains isolating switch-fuse mounted on the side. Electronic equipment is also used in connection with the Lumsden Machine Co.'s continuous surface grinder, the output from a selenium light cell being amplified to control a feed motor.

Some John Lund, Ltd., machines have the main electrical control panel mounted as a separate unit at the back of the machine, consisting of a shallow box with a deep lid, so that easy access is obtained to all component parts when this lid is removed. For some "Precimax" fine boring machines, the front switch panel for remote control is in the form of a door, which can be swung downwards to expose, with the panel in a horizontal position, the switch mechanisms and connections. Identification is by means of 10 body colours for cables, with 10 similar bands attached to the ends of the cables, giving 100 possible combinations. Extensive electrical interlocks and light signals are included on these machines.

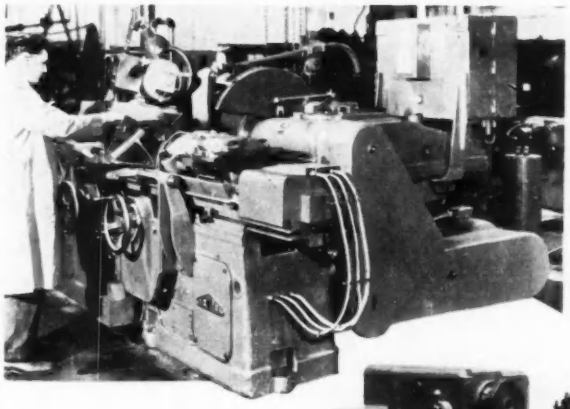
Rushworth and Co. (Sowerby Bridge), Ltd., have introduced a new precision guillotine in which the motor is housed under the machine bed and carried on a hinged platform to facilitate the tensioning of vee-belts. Electrical control gear is carried self-contained in the body of the machine. On this company's guillotines in general, fluorescent lighting is available as an extra, mounted at the front of the machine directly above the hold-down.

Hinged Cabinets

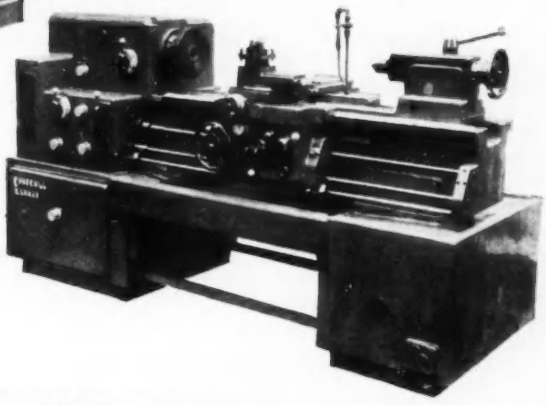
Extensive control gear (M.T.E.) on the Newall Engineering Co.'s new heavy duty automatic cylindrical grinder is housed in one hinged cabinet, at the rear of the machine, 4 ft 6 in. from the ground to give ease of access for maintenance. Another of this company's new machines, the "LAC" crankshaft grinder, has a similar control gear housing. An interesting item of this machine is the 3 h.p. workhead motor, which is a 6-pole slip ring machine incorporating d.c. injection braking.

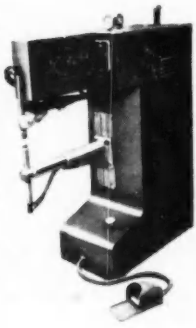
A new version of a vertical jig boring and milling machine employs a d.c. motor for the spindle drive, infinitely variable from 0 to 3,000 r.p.m. when supplied with a grid controlled mercury arc rectifier (Nevelin). The rectifier with its control gear and the main a.c. control gear are housed in a separate tool and control gear cabinet; push button controls are provided on the boring machine itself. Separate housing arrangements, this time in a sheet metal cabinet at the rear of the machine are made for the company's thread grinding machines to ensure ready access for maintenance.

In the larger range of Wickman Ltd.'s automatics, separate control-gear units, in a cubicle, are again used. It is considered that these have the advantage, against built-in gear, of allowing users to incorporate any suitable maker's equipment in the interests of internal standardisation.

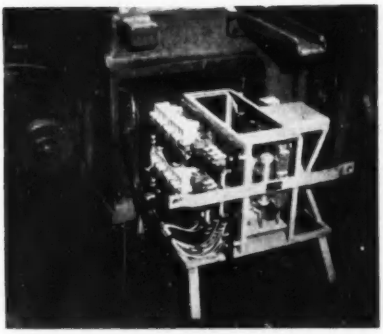


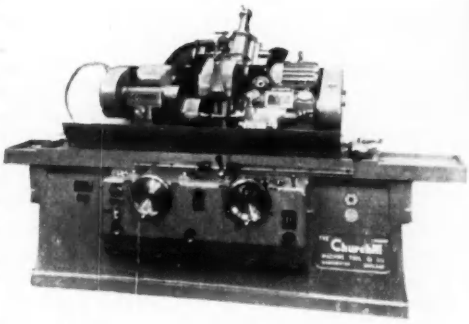
On the left is seen a Newall machine with back control panel mounted 4 ft 6 in. high for ease of adjustment. In the Churchill-Redman machine below, the control equipment is carried compactly in the left leg of the base





Left is a Philips 50 kVA spot welder, the new control panel of which groups all controls together. On the right is a close-up of draw-out control gear on a Churchill machine tool





The Churchill automatic plain grinding machine on the left has its electrical controls built into the back of the apron. Covers have machined faces to keep out dust

Electrical Exhibits

In addition to the electrical equipment that is to be seen as part of machine tools, a number of firms are showing their specialised products on stands devoted to electrical gear. This is the case with BROOK MOTORS, LTD., who are featuring their new "TC" type fan-cooled motor, previously seen at the B.I.F. It is claimed that the performance of this machine is equivalent to that of a fan-cooled totally enclosed model, but the amount of active material used is no greater than that for an open ventilated design.

Also on view is a prototype of a new f.h.p. motor. Embodying pre-loaded bearings in cartridge housings as an aid to quiet running, this will be available as a $\frac{3}{4}$ h.p. single-phase or $1\frac{1}{2}$ h.p. 3-phase unit.

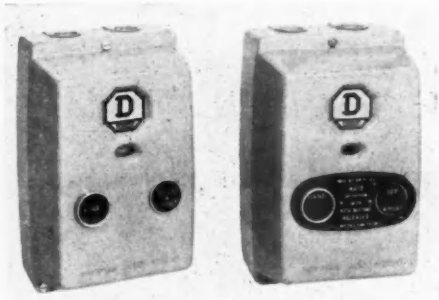
LANCASHIRE DYNAMO AND CRYPTO LTD. are presenting a development in the oil lubrication of ball and roller bearings. Oil is maintained at constant level in a sump in the bearing housing, and the bearing acts as a centrifugal pump while the machine is running. The rate at which the oil is circulated is regulated by an annular plate interposed between bearing and sump. This plate has the additional property of avoiding turbulence of oil so that it comes from the bearing as a relatively steady trickle.

Control Gear

Several firms are showing a wide range of control gear, amongst them the DONOVAN ELECTRICAL CO., LTD., who include a new small direct-switching starter for use with motors up to 3 h.p., 550 V. Starters for direct switching of a.c. motors up to 50 h.p. and special-purpose control panels are also on view, together with isolating switches and other components for building into machines.

IGRANIC ELECTRIC CO., LTD., include in their display a new design of process timer which gives independently adjustable running periods in two directions, with adjustable pause periods. Cycle time is adjustable between 10 seconds and 150 minutes. There is also a small electronic control panel designed for textile machines, besides a wide range of standard starters, controllers, limit and plugging switches. Included amongst the latter is a new friction type design. KEMPSTON ELECTRICAL CO., LTD., is another firm which includes timers, limit switches and push-button switches in its display. It also features a range of contacts and component parts for American control gear.

BRITISH ELECTRONIC PRODUCTS LTD. are showing motor speed control units for ratings



Push button control gear by Donovan Electrical Co.

from $\frac{1}{6}$ to 4 h.p., and "packaged" electronic Ward-Leonard control and photo-electric equipment. There is also control gear for resistance welding machines. M.T.E. CONTROL GEAR LTD. are featuring special panels "tailor-made" to customer's requirements, including examples for multi-motor control. The switches and contactors involved are also presented together with timing devices.

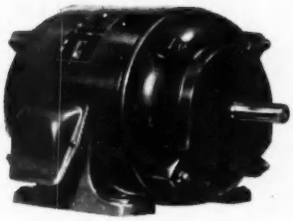
Welding and Heating

Prominent amongst the firms exhibiting electrical welding plant is the LINCOLN ELECTRIC CO., LTD. Two automatic welders are included in the range shown, one manually operated and the other fully automatic. There are also 150 and 300 amp motor generators. PHILIPS ELECTRICAL LTD. include their new 50 kVA air-operated spot welder in their exhibit, a machine which incorporates electronic control of welding time. There are also new 15 and 20 kVA pedal operated spot welders, and a portable gun welder. Three arc welding equipments are on view, including a new high capacity transformer.

In the range presented on the stand of SCIAKY ELECTRIC WELDING MACHINES LTD. is an improved version of their 400 kVA heavy-duty projection welding machine, and a new development in portable spot-welding designs. Another interesting model is a machine which has been specifically developed for completing a large number of welds simultaneously in wire mesh, without uneconomic mains loading.

BIRLEC LTD. are showing a self-contained laboratory type electric vacuum furnace for heat treatment and melting applications, which is capable of achieving temperatures up to 2,000° C. Besides other furnaces there is an h.f. induction gear hardening machine and a 6 kW mercury spark gap convertor for the generation of h.f. power.

On the PHILIPS stand is a 10 kW valve-driven 400 kc/s generator for h.f. induction heating,



The Brook Motors model seen above is a prototype of a new fan-cooled range. That below is presented by Lancashire Dynamo and Crypto, and incorporates a new lubrication system

Above is the new Radyne 30 kW induction heater which uses a single air-blast cooled oscillator valve for the main supply

while RADIO HEATERS LTD. show a new 30 kW output unit. This utilises a single air-blast cooled oscillator valve and so avoids the need for water recirculation, while its circuitry is such that correct matching with the load is obtained over a wide range of conditions. There is also a small 1 kW unit specially designed for accommodation under a bench or for mounting in larger machines. Induction heating is also demonstrated by WILD-BARFIELD ELECTRIC FURNACES LTD., who feature a "universal workhead" which can be fitted in a large number of handling jigs. There are also examples of heat treatment furnaces.

Miscellaneous

Amongst other items that merit attention are some new electric drills exhibited by DESOUTTER BROS. These are fitted with 0·35 h.p. motors of a new design, incorporating radio suppressors and having straight-line motor ventilation over commutator armature and field cores. ROZALEX LTD. show their range of protective barrier preparations, whilst on the IGRANIC stand may be seen low-voltage lighting equipment for machine tool use.

Metal rectifier equipment is featured by CRYPTON EQUIPMENT LTD., while on the same stand may be seen a typical heavy industrial switchboard as manufactured by LANCASHIRE DYNAMO SWITCHGEAR LTD. The "Nevitron" rectifier, described in our issue of September 18, is also shown there. METROPOLITAN-VICKERS ELECTRICAL CO., LTD., has staffed its stand with engineers, relying on the many machine-tool exhibits incorporating M.V. components to demonstrate its products. Rotary switches for a variety of applications are presented by SANTON LTD.

Opening Luncheon

In his speech at the inaugural luncheon held in connection with the exhibition, Mr. Duncan Sandys, the Minister of Supply, noted that the show was truly international. Nearly half the major machine tools being shown were of modern manufacture. Nevertheless, the home industry was itself building up a fine record, as export achievements showed.

Looking to the future, Mr. Sandys foresaw the imminence of revolutionary methods of shaping metal. He spoke of new systems of transforming electric power and of the induction of vibrations in the metal through intense air pressure or even sonic waves. By accurately focusing these forces on to a tiny spot, machines of the future would be able to cut metal without, in fact, actually touching it.

Problems and Practice

IN ENGINEERING

Tariff Terminology

TERMINOLOGY sometimes used in electrical tariffs is not always understood either by accountancy or engineering staffs. The following is an extract from a tariff under the heading "Charge for Magnetising Kilovoltampere-Reactive of Demand":—

"A charge of 6s. per month per magnetising kilovoltampere-reactive of demand shall be made for each kilovoltampere-reactive of demand in excess of the number obtained by multiplying the monthly maximum demand kilowatts by 0.4 (decimal four)."

This clause presented difficulty to the staff of a firm with which the writer is associated and he was asked to explain the clause in terms of kW., kVA., and power factor, terms with which they were familiar, and to estimate the variation of the charge with power factor, and the power factor at which the charge began to operate. The same problem may be of interest to others, and the following were the answers submitted; your readers could no doubt suggest alternative ways of expressing the clause in the terms required :—

Magnetising kilovoltamperes-reactive (usually abbreviated to kVAR) are related to kW and p.f. by the simple equation :—

$$kVAR = kW \times \tan \varnothing$$

(where $\cos \varnothing$ is equal to the p.f.).

For unit kW demand it is possible to tabulate against corresponding values of power factor (*a*) tan Ø (*b*) kW tan Ø (kVAR), (*c*) kVAR—0·4 kW, (*d*) penalty per kW demand.

Power factor.	kW. an Φ	kVAR—0·4 kW	Shillings penalty per kW demand.
0·9285	0·4	0	0
0·9	0·4841	0·0841	0·504
0·85	0·6200	0·2200	1·320
0·8	0·75	0·35	2·150
0·75	0·8821	0·4821	2·892
0·7	1·02	0·62	3·720
0·65	1·1695	0·7695	4·620
0·6	1·3333	0·9333	5·4998

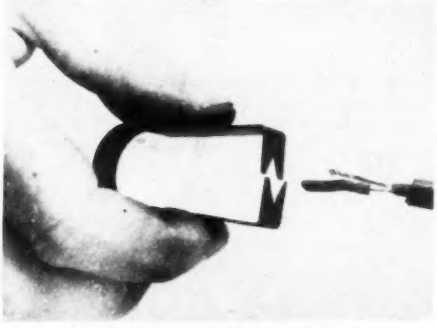
These figures show that the penalty operates when the power factor falls below 0·9285 and increases fairly uniformly between 0·9 and 0·6 p.f. at the rate of 9d. to 10d. per kW of demand for every 0·05 decrease in power factor. The way in which the penalty charge per kW of demand varies with the power factor may be depicted graphically by plotting the figures in the last column against those in the first. It will then be seen how closely to a uniform rate the penalty charge varies with power factor.—*R.A.*

Simple Insulation Stripper

I HAVE used the simple insulation stripper illustrated here, for a long time with considerable success. It can be made in about 10 minutes in a bench vice, using a pair of round-nosed pliers and a file.

The stripper is made from mild steel strip, 3/8 by 1/32 in. and has a pair of jaws bent up at one end so that they overlap one another. The vees filed in the jaws have a 90 degree angle and only one of the jaws has the V edges filed to a knife edge for cutting through the insulation on the wire.

A combination of one blunt and one sharp V, coupled with the use of soft steel for the



The insulation stripper in operation

tool, ensures that only the insulation is severed and the wire remains undamaged. The tool is applied to the wire by nipping the V-jaws together on to the insulation. The exterior insulation of the twin core cable illustrated requires that the stripper be turned once while nipping in order to sever the thick rubber. An axial pull then strips off the covering. The small diameter inner wires can be stripped by merely nipping with the jaws and pulling the stripper, no rotation is necessary.

The soft steel used has sufficient resilience to ensure that the jaws spring open when pressure by the fingers is released.—*C. T. Bower.*

POWER FOR RAIL TRACTION

Mr. C. M. Cock compares available systems

THE difficulty of assessing the relative merits of the various forms of rail traction—steam, diesel, electric and gas turbine—was well brought out yesterday when Mr. C. M. Cock, President of the Institution of Locomotive Engineers for 1952-53, delivered his Presidential Address.

He began by pointing out that the steam locomotive, in its present form, could not be dismissed in any peremptory fashion. It was sturdy, reliable and cheap, and had proved the backbone of the rail systems in this country and abroad. Nevertheless, it suffered from low thermal efficiency, and required much labour in repair, fuelling, watering and general servicing. For these reasons, investigations had been carried out with other forms of motive power, some of which had become firmly established.

Electrification

Although the electric locomotive was easily the most powerful and efficient of all types of locomotive, and was the cheapest to maintain, it required a fixed feeding installation consisting of contact lines, substations and possibly a high voltage distribution system. The capital cost of this fixed equipment had to be charged against the running costs of the locomotive when comparisons were made with other prime movers. However, under favourable conditions, electrification could be the cheapest and most efficient of all forms of transport.

The three basic systems of electric traction were d.c., a.c. (single-phase) and a.c. (three-phase). The last of these had become virtually obsolete, the first was used successfully in many countries throughout the world at voltages between approximately 600 and 3,300, and many miles of low frequency (16⅔ or 25 c/s) a.c. single-phase track were in operation. Experimental work was also being carried out on 50 c/s single phase.

When considering the voltage to be adopted, it was necessary to investigate the traffic density and the potential economic return, as well as the availability of power and its source. In Britain, it was estimated that complete electrification would require some 5,700 million units of energy per year—about 12% of the total units sold in the year 1950-51. As the operating voltage was increased, the distance apart of substations could be greater, the copper section smaller and the supporting structures lighter for equivalent available h.p. The locomotives and electrical gear, however, became more expensive. Traffic density also affected the voltage, a high traffic density favouring low voltage and low density favouring high voltage. In composite systems where heavy suburban traffic had to be operated along with long-distance through traffic a compromise would have to be reached.

Fifty c/s Progress

The use of 50 c/s current had proved attractive due to the lowered costs of the fixed installation, and with the continued development of the single-phase commutator motor and the mercury arc rectifier the problem of application was not now so difficult. Several different tractors were being tried experimentally on the 20 kV 50 c/s line between Aix-les-Bains and La Roche-sur-Foron, while in America rectifier type 6,000-h.p. locomotives working on 25 c/s had been commissioned on the Pennsylvania Railroad. In the Belgian Congo some 62 miles of line were being electrified on the 50 c/s system. In Britain trials with multiple unit trains were to begin on the Lancaster-Morecambe-Heysham line. Most development was, however, being carried out in France, where the S.N.C.F. were proposing to electrify the Valenciennes-Thionville line with a possibility of projecting this into Germany as far as the Rhine at Koblenz. Indeed, it had been reported that the S.N.C.F. were so satisfied with their experiments that they were to devote all their financial and experimental resources to 50 c/s traction rather than continue with the 1,500 V d.c. system which had hitherto been their accepted standard. While they did not consider that any serious disturbance to the system would occur due to the unbalanced load, it might yet be hardly prudent to accept this as a matter of course. In Britain, 1,500 V d.c. had been accepted as standard, but 50 c/s might well be used for secondary lines.

Diesel-electrics

In the United States the diesel-electric locomotive had had a remarkable success, and at the end of 1951 there were nearly 18,000 of these units in operation. The main attraction was on economic savings due to high thermal

efficiency, elimination of standby losses, and lower maintenance charges. In addition considerable speeding up was possible, together with an increase in the gross freight ton miles hauled per locomotive mile. In this country, theoretical and practical experience showed that the relative running saving between steam and diesel-electric locomotives was only about 10%. When capital charges were included the comparison became in favour of steam.

Gas Turbines

The gas turbine showed great promise, and here again several units were running. At the moment an overall efficiency of about 15·5% was practicable, although studies indicated that much higher efficiencies were theoretically possible. A major trouble was caused by vanadium in the fuel which affected the turbine blades. Further, the capital costs and maintenance charges had not yet been assessed. Comparative tests on British Railways had shown that the overall efficiency of gas turbine was little more than that of steam locomotives.

On the general question of transmission from prime mover to wheels, Mr. Cock thought that electrical methods were the best.

He concluded by stating that there was sufficient evidence to justify the introduction of further large-scale electrification schemes' together with extension of diesel traction, particularly in the shunting field. Complete electrification would save at least 14 million tons/year of high-grade coal, and if and when nuclear power became available, electric traction was the most convenient way to use it. This was due to the fact that it would be more economical to use big reactors at large central stations than small mobile units.

Bushing Design Saves Tank Space

ONE of the difficulties commonly found when conventional bushings are used on transformers is associated with the need to provide adequate clearances around the terminal bushing. This is necessary to avoid sparkover to the tank walls, and at high voltages the necessary increase in the dimensions on the tank on the bushing mounting turrets may be large and expensive to provide.

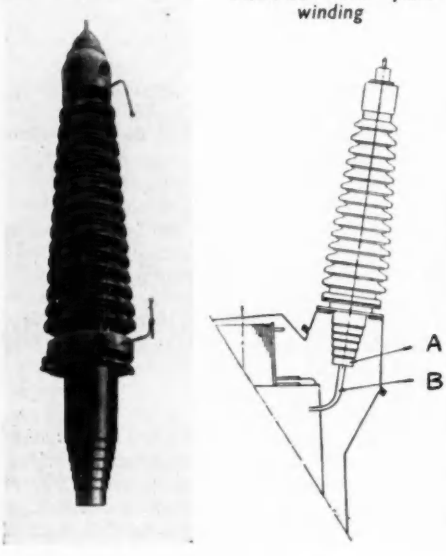
As a result of research into this aspect of transformer design, the Bushing Co., Ltd., of Hebburn-on-Tyne, has evolved a re-entrant bushing. This consists of a synthetic resin bonded-paper condenser oil-filled insulator which has its air end protected externally by a porcelain rain shed. The re-entrant feature of the design applies to the lower end, which is constructed in such a way that the end of the high voltage electrode of the bushing terminates within the body of the insulator some way from its lower extremity.

Transformer lead-in cables, which join the electrode to the winding, are fully insulated to eliminate sparkover from the bottom of the bushings to the cables.

The bottom end of the bushing, in consequence, takes up a voltage intermediate between the end of the h.v. electrode and that of the earthed electrode. This value depends on the design and disposition of the equipotential layers contained within the body of the bushing. Clearances can thus be reduced.

In their manufactured form, these bushings are fitted with standard "Texolex" top cap and oil reservoir. The top cap is removable, and the connection to the transformer lead can be made without any risk to the insulating properties of the bushing. In all respects the design of the bushings has been made to comply with the current requirements of the B.E.A. and with the new draft of B.S. 223.

The 275/300 kV re-entrant bushing. A, shows re-entrant condenser bushing; B, shows paper insulated lead from winding



HARROGATE FINALE

A.P.L.E. speakers consider road safety at home and overseas, gas or electricity and concrete for lighting columns

ELECTRICITY took a back seat in the remaining papers of the A.P.L.E. Conference last week at Harrogate. Thursday morning a paper by Mr. N. HUDSON, M.B.E., M.Inst.Gas.E., M.Inst.F., the chief commercial officer, North Eastern Gas Board, dealt mainly with the costs of converting the old gas fittings to modern types. In "Street Lighting—A Wise Compromise," stressing that his remarks were equally applicable to the Electrical Industry, he went on to outline a short term and a long term policy for the adequate lighting of both traffic routes and other roads, to effect a wise compromise without considerable expenditure in converting from gas to electricity.

Concrete Columns

The final paper on Friday morning, on "Know Your Materials—Design, Manufacture and Erection of Concrete Lighting Columns," by Dr. D. F. ORCHARD, PH.D., B.SC.(Eng.), A.M.I.C.E., A.M.I.Struct.E., of the Cement and Concrete Association, provided a thorough survey of the subject. Saying that the design and manufacture depends upon the method of compaction of the concrete and on whether reinforcement or pre-stressing is used, he went on to discusss other structural design requirements. Here some difficulty is found in determining the correct loading and laying down satisfactory design bases for bracket arms.

Some thought has also to be given to the design of the base compartment. All that need be fitted here was the fuse, link and switch for sodium, fluorescent and filament lighting, as other ancillary equipment associated with the first two types can be accommodated in the lantern. Heat given off by mercury vapour lamps precluded any possibility of housing equipment in a similar manner.

DISCUSSION

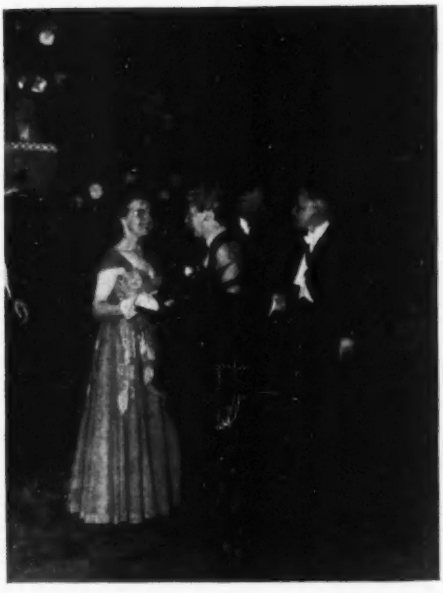
Street Lighting Control

Mr. Axford's paper proved to be as controversial as had been anticipated, speaker after speaker disputing the figures given in the paper, principally on questions of cost. Another topic was centralised control, Mr. GRANVILLE BERRY, of Coventry, suggesting that its adoption would lead to lighting being taken out of the engineers' control into the hands of Area Boards. (It was he also who dared to prophesy that future control would transcend these mundane methods and look to radio as its medium.) A following speaker, however, felt Mr. Berry was being unduly pessimistic about this subject. Mr. L. R. OSGOOD, of Luton, testified to the efficacy of daylight control. He had experienced both types in operation. After setting up, they had proved very satisfactory and did not warrant constant cleaning. Other points included uses of polythene insulation and possibility of external interference upsetting centralised control, and were suitably replied to by Mr. Axford.

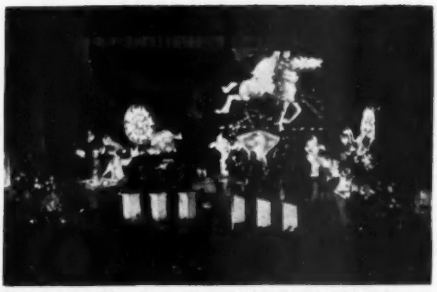
Decorative Lighting

A feature of Mr. CARPENTER's paper was the Blackpool illuminations, in miniature, which, assembled on the stage provided an apposite conclusion. Discussion, however, was conspicuous by its brevity. In opening, Mr. T. B. HILL, of Southend, said that the success of a town's

The President and his lady receive Dr. Holmes, president of the I.E.S., and Mrs. Holmes



illumination was due to a combination of art, inventiveness and engineering and whether its cost can be paid for out of the increased revenue. His concern, however, was for road safety, and the distraction decorative lighting, especially for advertisement purposes, had for the motorist. Dr. H. H. BALLIN (Thorn) took up the question of inventiveness further. Local authorities, he felt, could use their natural amenities to better purpose. Of electro-luminescent capacitors he doubted whether they would be commercially available for some years yet. An appeal for a lighting week to be held concurrently with Coronation week, by Councillor EASTWOOD, of Manchester, concluded the discussion. In his reply, Mr. Carpenter said that in Blackpool it had been found necessary to lower the level of street lighting during the season so that, whilst sufficient for road users, it did not interfere with the illuminations.



The stage illuminations at the President's Dance

Street Lighting, U.S.A.

As might be expected from an overseas contribution, considerable comment followed this paper. Of the six speakers, three devoted their energies to lighting and accidents, both Mr. J. M. WALDRAM (G.E.C.) and M. L. GAYMARD (Paris) questioning the reliability of statistics relating the accident rate to the standard of lighting. Neither country had had any real success in this direction, and in addition Mr. Waldram doubted whether publication of these figures, which only illustrated the obvious, had any real value. Mr. OSGOOD followed up on this by an appeal for a lessening of the emphasis of the part played by lighting, which would become, he feared, the whipping boy, whereas the real culprit would go unmasked.

Turning to technical aspects of the paper, Mr. F. WIDNALL (B.T.H.) pointed out that practically all American lighting was on the series system but he doubted if one such installation could be found in this country. Which country, he asked, was guilty of neglect? Another theme was taken up by Mr. G. PENNY (G.E.C.), who expressed curiosity on their methods of colour correction and the availability of materials used. Dr. DICKERSON, replying to part of the discussion, stressed that the point of the 'horror' stories of the high death rate was to arouse public opinion and that from the reliability viewpoint, enough figures will show the connection between lighting and deaths. On the technical details, Mr. P. H. HOUSER, his assistant, took over and, dealing satisfactorily with uses of colour correction, continued by saying that the series system was still currently popular in America, a recent installation of 2,500 W using polyethylene insulation. His final sally on this subject was a suggestion that we should study it and then possibly use it over long sections of our trunk roads at present unlighted.

Street Lighting Compromise

Despite attempts by opening speakers to keep the tone of discussion on a non-partisan level, it soon became apparent that their efforts made little effect on later comments. In the main speakers attempted to point out that gas authorities, although resigned to inevitability of 100% electric street lighting, were confident that they could still make a useful contribution. Mr. R. H. BONE (Scottish Gas Board) denied that the industry had lost interest in street lighting and suggested that local authorities had lost interest in gas. Later Mr. H. CORK, of Manchester, agreed wholeheartedly, saying that his corporation was convert-

This happy group at the Mayor's Buffet included Dr. Holmes and Mr. C. C. Smith, Mrs. Milligan, Mrs. Durham and Mrs. Smith

ing to electric lighting as fast as possible. Other points which appeared in various contributions were that lighting should continue to rely on two industries to stimulate competition and that the appropriate industry should co-operate with lighting authorities in modernising existing fittings, speakers from both sides accusing the other of failing in this respect, interspersed with considerable discussion on relative costs of conversion to electricity or modernising existing gas fittings. Mr. HUDSON made suitable reply.

General view of the delegates at lunch at the Cairn Hydro Hotel

Luncheon Speakers

Some 360 guests assembled in the Cairn Hydro Hotel, Harrogate, for the A.P.L.E. Annual Luncheon. Following the toast to the Queen, Mr. C. C. Smith, A.M.I.E.E., vice-president, proposed the Corporation of Harrogate and the Guests. Harrogate's mayor, Councillor A. V. Milton, J.P., responded.

Proposing the toast to the Association, the principal guest, Major-General B. K. Young, C.B.E., M.C., Director-General of the Royal Society for the Prevention of Accidents, felt that the Association would be pleased to hear that the Ministry of Transport had allocated £3 million for illuminating "black spots," though he doubted whether many authorities would get more than a "small piece of this pancake." Referring to road casualties, he felt that the heartening trends during the last six months would continue following the illumination of "zebra" crossings.

In responding, the President, Mr. E. Howard, F.I.E.S., was sure that if given the necessary financial support, lighting authorities could assist the Society, and deplored this false economy on essential services. He concluded by referring to the value of the international character of the conference.

(Left to right), Mrs. Howard, the President, Mrs. Holmes, the Mayor, Mayoress and Dr. Holmes at the President's reception in the Royal Hall

Fitting Sheaths

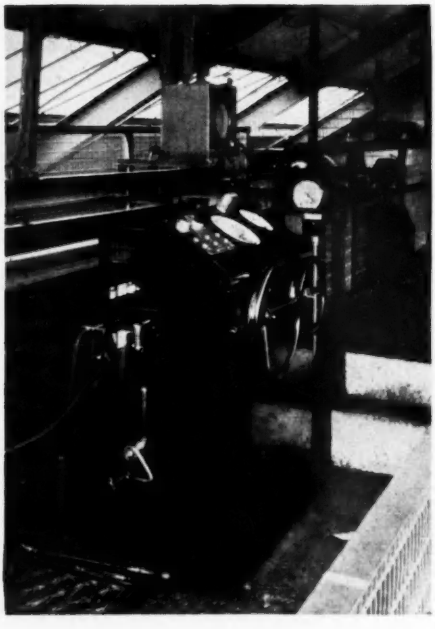
SIMPLE PROCESS USED IN THE MANUFACTURE OF ALUMINIUM SHEATHED DESIGNS

ALUMINIUM sheathed cable has gained widespread acceptance since its introduction some four years ago. Behind the attainment of a standard of production which satisfies cable users in a great number of industries lies the development of simple methods readily controllable to give a high degree of accuracy. What these are we were privileged to be shown during a visit last week to the Charlton works of Johnson and Phillips, Ltd.

Construction

In essence, the method adopted is the placing of the prepared cable core inside an aluminium tube, and then pulling the tube through a die so that the core is closely covered by the metal. The whole process is carried out on a gantry erected in the roof trusses of an existing 350-yard-long cable shop. Tubes extruded from ordinary (99·6%) purity aluminium are received on drums from various suppliers, in lengths up to 300 yards long. To avoid trouble with condensation of moisture, these tubes are plugged at each end. All tubes are tested with an inert gas at pressure before use.

The whole sheathing operation is controlled from this desk at the sinking end of the gantry



The tube is hauled from its drum through a series of rollers placed mutually at right angles, which effectively straighten it, and is laid on rollers running the length of a trough on the base of the gantry. As it is laid, a tow-line is threaded into it, for later use in handling the core. An ingenious magnetic method is used to facilitate insertion of the tow-line. At the end of the line a steel plunger is attached, and this is inserted in the leading end of the pipe. A powerful electro-magnet is then energised, and this holds the tow-line steady while the tube is drawn over it.

At the end of this operation, then, there is an aluminium tube lying the length of the gantry, with a tow-rope threaded through it. The end of this tow-rope is next released from the electro-magnet, the plunger is unscrewed, and the leading end of the cable core attached. Once more the hauling operation is commenced, and this time it ends with a cable core lying inside an over-size aluminium tube, with a considerable length of cable core not yet having entered the tube.

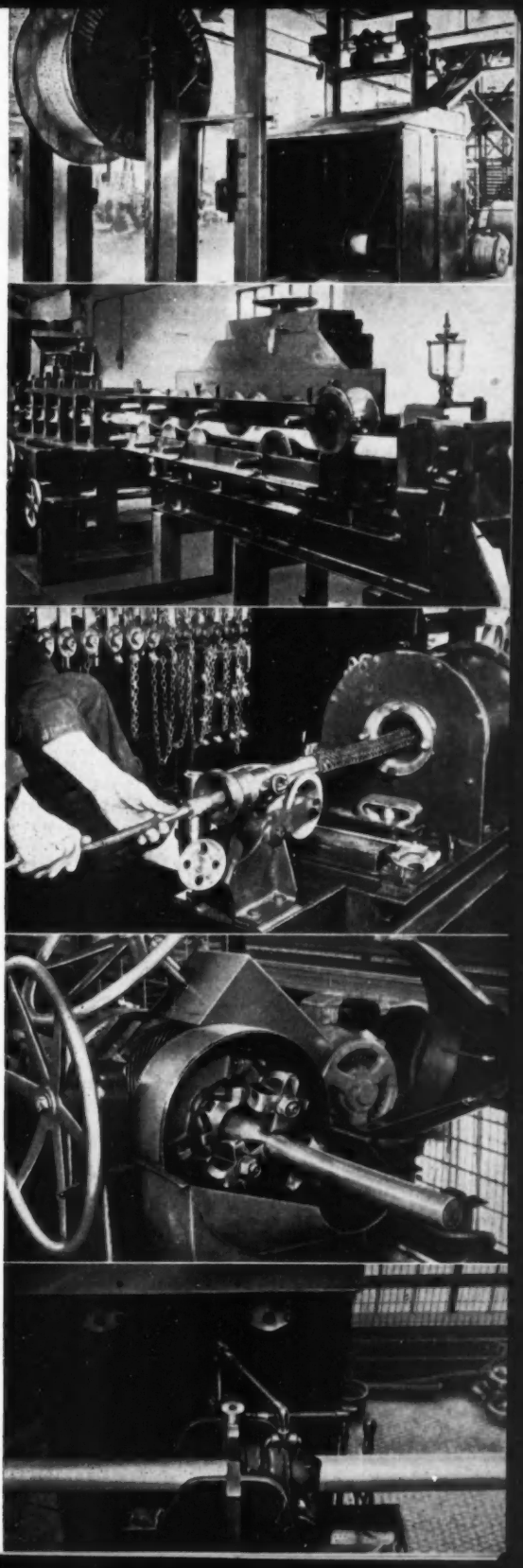
Sinking End

Attention may now be focused on the far (or "sinking") end of the gantry. Here are situated the controls for the large-wheeled winch which hauls the tow-line. When the leading end of the core has emerged from the tube, the end of the tube is swaged down over the cone for some 12 inches to allow it to enter the dies which reduce tube diameter.

Two dies are used. The first gives a 2% reduction in diameter, and is principally concerned with ensuring that the tube is truly circular in cross-section when it enters the second die, where a considerably greater reduction takes place. The sheathed cable passes over the winch drum on to a normal transportable cable drum.

to Cables

The process begins (top picture) with the tube being drawn up to the gantry, and then passing through straightening rollers to remove lateral distortions. A steel armature at the end of the draw rope is inserted into the tube (third picture) and held between by a powerful electro-magnet. After the tube has been pulled to its full length, and the cable core hauled through it, the end is swaged down in the machine shown in the fourth picture. This enables the end to be inserted in the two reduction dies (bottom picture) and the whole length of tube is then sunk on to the core



It will be realised that, as the tube passes through the dies, the reduction in diameter is matched by a corresponding increase in length. This explains the excess length of cable core over original tube. At the end of the operation that core is completely covered, and according to the amount of reduction applied, the finished lengths may be anything from 333 to 440 yards.

To give some continuity to the operation, the tow-rope used to haul the core is returned to the starting end while the previous cable is being completed. A new tube is led up the ramp, and the tow-rope and plunger introduced into it. The leading end of this second tube is then connected to the tail of the first tube length by a special coupler, and is thus hauled over the tow-line as the first tube length is being sunk on to its core.

Two identical plants are used, side by side in the gantry, and the average output is 3,000 yards of power cable or more in a 10-hour shift.

All-in-all, a very wide range of cable sizes is dealt with by this process, but such is its flexibility that only some ten sizes of tube, with diameters varying in $\frac{1}{8}$ in. steps up to 1 in. and in $\frac{1}{4}$ in. steps above are needed.

It is interesting to note that the German cable industry gave considerable attention to the problem of providing an aluminium sheathing for cables. Two methods were considered, firstly an extrusion process similar to that used for lead sheathing, and secondly a process whereby helically or longitudinally wrapped strip could be applied to the core and then sealed by webbing. In spite of the fact that a plentiful supply of soft super-pure aluminium was available, only a little indifferent quality cable was produced. The effective welding techniques since developed in this country were not, of course, available.

overseas news

N.S.W. Dollar Bid

The New South Wales Government has halted in its efforts to obtain a substantial dollar loan from the Commonwealth Government for the purchase of American electrical plant. It will be recalled that we exclusively reported on August 28 that a deputation consisting of Mr. H. Ewbank, of Ewbank and Partners, consultants, and representatives of the English Electric Co. and Babcock and Wilcox, had flown to Sydney on hearing that the New South Wales Electricity Commission was seeking dollars to buy U.S. generating plant. Now fresh tenders are being called from outside the dollar area and British manufacturers have been asked to submit offers for the supply of a 75,000 kW generator together with boiler plant. The French firm, Schneider Westinghouse, is also seeking the contract and has offered to supply the plant within three years, it is reported.

Mr. Cahill Still Hopeful

On this question of ordering new power plant for New South Wales Mr. Cahill, the State Premier, is still satisfied that purchasing the necessary equipment from the United States will be the best deal they could arrange. He prophesied that New South Wales would have another electricity crisis in 1955 or 1956, when it was expected that a new peak demand would outstrip present additions to equipment. In Canberra, the Prime Minister, Mr. Menzies, said the Government's dollar committee had examined the N.S.W. application for dollars to buy U.S. plant, and the Government would shortly make a decision based on the committee's report.

Contract Payments

The proposal of the State Electricity Commission of Victoria to withhold payment of its full debts to the large number of Australian and overseas manufacturers, has caused some sharp comment locally this month. It seems that the firms are being told that their accounts cannot be paid in full at present, and instead are being asked to accept payment of half the amount owing, the balance being deferred until the next financial year, with the Commission paying interest on that debt at 5%. The Commission owes £6 million to Australian and overseas companies, it is stated. The debt to one overseas firm with British connections being nearly £250,000. But business firms say they cannot afford to defer payment of their accounts. A deputation of business men has already approached the State Premier on the matter but has received no satisfactory answer. Mr. R. A. Hunt chairman of the Commission has admitted that the larger contractors had been asked to agree to deferred payments for the Commission could not meet its obligations without some short-term help from the State or the Commonwealth.

New 132 kV Line

The Electricity Trust of South Australia has made a start surveying the route along which a 132 kV transmission line will be erected to supply the Radium Hill uranium field. The line will run from Morgan, a distance of about 130 miles, and will cost about £750,000. It is considered that the line from Morgan would be more economical than one of the alternative routes from Waterloo. In surveying the route a helicopter is being used.

Quebec Wants Assurance

An unexpected turn has been taken in the hearing of the International Joint Commission concerning the proposed joint hydro-electric development of the International Rapids section of the St. Lawrence. In earlier discussions the Hydro Electric Power Commission of Ontario has been named as Canada's party to undertake the scheme. But last week, Mr. Sauve, representing the Quebec Premier, Mr. Duplessis, argued that under the Canadian constitution, this proposed development of hydro-electric power was the exclusive right of the Quebec Province, adding that although they were anxious to co-operate in helping Ontario to get much-needed power, they must make certain Quebec would not be harmed. It was pointed out that Quebec's power production farther down the St. Lawrence will be three times that of either Ontario or New York State in the proposed international power development.

Atomic Power

Claiming that Ontario was as far advanced as any area in the world in atomic development, Mr. R. Strike, vice-chairman of the Hydro-Electric Power Commission, recently stated that the Province will be utilising atomic power for industrial purposes within 10 years. The matter was receiving high priority in the Commission's future plans, he said. First priority was being given to power developments along the Niagara River, second came the St. Lawrence power project, and third was the harnessing of the atom.

Work at McArthur Falls

Clearing operations have been started at the site of Manitoba's new power plant at McArthur Falls where a $22 million plant is expected to be completed in late 1954 by the provincial Hydro Electric Board. Tenders for the general contract

work closed earlier this month. The plant itself will be built near lower McArthur Falls and will utilise and combine into one 23 ft head of water a 15 ft natural decline. The top of the dam will be about 50 ft above the river bed and will be 6,100 ft long.

Calgary's Task

Calgary Power, Ltd., will build the Bearspaw dam recommended by a Royal Commission investigating causes and cures of winter flooding of the Bow River as the most important single solution to the problem. This information has been given by the Provincial Minister of Agriculture to the city commissioners. and the Bowness town council. But he did not indicate whether the province would share in the cost of construction of the dam.

Mysore's Increased Output

The Mahatma Gandhi hydro-electric plant at Jog, in the north-west of Mysore state, which is at present generating 48,000 kW, will soon be generating an additional 72,000 kW when the second stage of the scheme is completed. This second stage comprises four 18,000 kW sets. Mysore's electric power is not confined to the State alone at present. The State has agreed to give a bulk supply to Coorg and Bombay, and to parts of Madras state. For the supply to Coorg details of an agreement are now being finalised. Power from the Jog scheme will be tapped at Sagar and a 66 kV line will run from Krishnarajpet in Mysore State to Fraserpet in Coorg. Mr. George Chandy, Mysore's chief electrical engineer, recently stated that the increased output from the Jog scheme will be fully utilised by 1955, and it is therefore imperative for the Mysore Government to ascertain new sources of power development. The Honnemaradu Project which the State Government had in view was full of potentialities and from this project, by utilising the waters of the River Sharasvathi, a total of 400,000 kW could be generated. An aerial survey of that project was now being made, he said. The Government had also under consideration proposals for increasing power generation at Shimsha. He pleaded that finance should not come in the way of expediting the Honnemaradu Project for according to the statistics power generation from it would be among the cheapest in the country.

Railway Electrification

Estimates had been prepared for extending electrification of the Indian Railway between Tambaram and Chingleput, the deputy Minister for Transport, Mr. O. V. Alagesan, revealed earlier this month. These estimates are being sent to the Railway Board for examination. In referring to the abolition of first-class compartments, he also disclosed that on mail and certain express trains where the public demand was large enough to justify the introduction financially, it was proposed gradually to introduce air-conditioned compartments.

Action on Nationalisation

All new electricity supply undertakings in Uttar Pradesh will be nationalised, but the private concerns now operating will carry on until the end of their present agreements. This policy statement was made on behalf of the Government recently when the Bill seeking extension of State control over electricity by two years came up before the House. The Finance Minister said that the Government could not nationalise private electricity undertakings without paying compensation, for which there was no money available just now.

Hutt Valley Results

Mainly due to an increase in tariffs and a jump in the unit sales per consumer, the Hutt Valley Electric Power Board reports a net surplus of £20,447 for the year ended March 31 last, compared with only £472 for the previous year. A further 1,162 consumers were connected during the twelve months, 263 of them being in State all-electric houses, bringing the total number of consumers to 27,424, of which 24,974 are domestic. The average consumption of the latter was nearly 4,000 units during the year, as against just over 3,000 for the previous period. This heavy increase, despite the rationing, was to some extent attributable to the shortage of gas and coal brought about by the waterfront strike. At the end of last March, the Board had 15,428 electric cookers and 16,345 water heaters connected to its system, representing as a percentage of consumers 56·25% and 59·60% respectively. Revenue from domestic sources, at £257,565, was 54·8% of the total revenue. The year's working was also noteworthy in that capital outlay amounted to £984,709, of which £295,642 was for secondary distribution work and £183,036 for main transmission lines.

Visitor from Singapore

Having recently visited Britain to ascertain the position regarding equipment for the new power station of the Singapore Municipality, Mr. C. C. Payne, city electrical engineer, has stated that he was convinced deliveries would be speeded up, and there was little doubt the programme of construction would be maintained. He emphasised that the main difficulties of manufacturers in Britain seemed to be getting steel, and he was concerned regarding the supply of about 3,000 tons of structural steel for the second stage of the new Pasir Panjang station. He had discussions on these matters with the consulting engineers, Preece, Cardew and Rider, and also attended to the contract between the City Council and the civil contractors, George Wimpey and Co. We understand that the first section of the new station is rapidly nearing completion. On his return to Singapore, Mr. Payne also referred to the Council's difficulty in getting men to fill the key posts in the undertaking. He said senior electrical engineers in Britain were reluctant to go out there because they would lose their superannuation and pensions from the B.E.A.

PERSONALITIES

IN THE INDUSTRY

At the end of this month, **Mr. S. C. Irving,** A.M.I.E.E., assistant station superintendent at Poole power station, Southern Division, B.E.A., since 1950, is leaving that position to take up the post of works engineer to the Carlisle textile firm of Ferguson Bros., Ltd., where he will be responsible for mechanical, electrical and structural maintenance. Prior to going to Poole Mr. Irving was superintendent at Hounslow generating station. Born at Bowness - on - Windermere and educated at Southport College, he started at Southport power station but left there in 1929 to go to the Valley Road, Bradford, generating station. Later he was control engineer and relief charge engineer at Croydon, and in 1937 was appointed charge engineer at Bankside, London. He left there in 1942 to take up the position of assistant superintendent at Hardingstone Junction, and became station superintendent four years later. Mr. Irving was last week the recipient of a presentation made by **Mr. C. J. Stockell,** superintendent, on behalf of the Poole station staff.

Mr. S. C. Irving

Four new works appointments are announced by the Metropolitan-Vickers Electrical Co. They are: **Mr. R. H. S. Turner,** M.A., M.I.P.E., is now assistant works manager of the main works; **Mr. A. Paterson,** B.SC., A.R.T.C.(Glasgow), A.M.I.P.E., in addition to his duties as superintendent, Motor Department, becomes assistant works manager of the Mosley Road Works (including Leonard Works); **Mr. J. S. Wright,** B.SC.(ENG.), A.M.I.E.E., takes over as superintendent of the Plant Department; and **Mr. J. A. Brooks,** B.SC.(ENG.), A.M.INST.W, is now superintendent of the Leonard Works. All these four served college apprenticeships with M.V. Mr. Turner, who is president of the Manchester Section of the Institution of Production Engineers, did erection work in London prior to joining the Plant Dept. as a manufacturing engineer. In 1938 he transferred to Instrument and Meter Dept., becoming assistant superintendent two years later, and in 1944 returned to the Plant Dept. in the same capacity. He became superintendent there in 1948. Mr. Paterson went into the Motor and Engineering Dept. in 1930, later turning to motor manufacture and was superintendent's engineer until 1942 and thereafter assistant superintendent, Motor Dept. He was appointed superintendent there in 1945. Mr. Wright was for four years in the Switchgear Engineering Dept., but after turning to the manufacturing side as a development engineer became assistant superintendent of the Switchgear Dept. early in 1949. He was a member of the Productivity Team on control gear and switchgear which visited the U.S. that year. Mr. Brooks became development engineer in Leonard Works after the war but later moved to Mosley Road Works where he was responsible for the layout and installation of the Heating Element Dept., of which he eventually took charge. Returning to Leonard Works in 1949 he became assistant superintendent there in July, 1950.

Mr. Allen G. Clark, chairman of the Plessey Company, and **Mr. W. H. Newton,** chairman of Serck Radiators Ltd., have been appointed additional directors of National Plastics Ltd.

Troughton and Young (Lighting) Ltd. announce that their design department will now be led by their two senior designers—**Messrs. D. S. Shellshear,** M.S.I.A., and **W. J. C. Butcher,** who have had long experience with the company. They have both during recent years collaborated closely with **Mr. A. B. Read,** R.D.I., who recently left the company to become Director of Design of the Carter group of companies.

Mr. R. H. S. Turner

Mr. A. Paterson

Mr. J. S. Wright

Mr. J. A. Brooks

The G.E.C. Sales Team entraining at Waterloo

The improved living conditions which have resulted from the development of secondary industries and the consequent growth of a more balanced economy in the Caribbean area, have prompted the General Electric Co. Ltd. to send a team of experts to six territories there with the object of increasing the sales of British domestic cookers, refrigerators, washing machines household appliances and heavy cooking equipment for hotels and work's canteens. Demonstrations in the use of domestic equipment will be given by **Miss Margaret Leader,** senior housecraft adviser to the G.E.C., and **Miss Sheila Cairns,** G.E.C. demonstrator in Scotland, while heavy duty cooking equipment and industrial applications of electricity will be demonstrated by **Mr. George Bilsland,** who is responsible for sales of G.E.C. industrial catering equipment overseas. Leader of the team is **Mr. Ivor Williams,** manager, G.E.C. Domestic Cooker Dept. Countries visited will include British Guiana, Bermuda, Jamaica, Trinidad and Nassau. The team, which left on September 16, expects to be away for a period of three months.

Resigning his position as commercial manager of the Turbine Division of the Brush Electrical Engineering Co., Ltd., **Mr. G. T. H. Spurling,** B.SC., A.M.I.Mech.E., has taken up a post as chief assistant to **Mr. I. V. Robinson,** wh.sc., M.Inst.C.E., M.I.Mech.E., who is head of all the Turbine and allied Plant Sections of B.E.A.M.A. Our accompanying photograph was taken recently when Mr. Spurling (on the right) was presented with a brief case and a cheque by **Mr. J. W. C. Milligan,** general manager and director, on behalf of his colleagues. Mr. Spurling served the Brush Co. for over 22 years. Originally he was in the Estimating Department of which he eventually became manager, dealing with tenders for all that company's electrical products, but prior to leaving he was dealing solely with turbine work, and represented the company in connection with all negotiations with the B.E.A.M.A. group. His successor at Loughborough is **Mr. B. L. Gover.**

Mr. R. M. A. Smith, B.Sc.(Eng.), M.I.E.E., has been appointed assistant sales manager of the Instrument and Meter Department of the Metropolitan-Vickers Electrical Co. He joined the M.V. Instrument and Meter Engineering Dept. in 1936 after a college apprenticeship, and specialised in the design of automatic control systems, protective gear, and the Ripplay centralised control system. He transferred to the Instrument and Meter Sales Dept. in 1950. Mr. Smith has visited Denmark, the U.S., New Zealand and Australia on behalf of the company, and was jointly awarded the Sir John Snell Premium of the I.E.E. in 1949 for his paper on 'Centralised Ripplay control on H.V. Networks.'

Mr. R. M. A. Smith

Alderman Wright Robinson, until recently chairman of the North Western Electricity Consultative Council, and **Lord Cherwell,** will receive honorary associateships of the Manchester College of Technology at a ceremony on October 11 as part of the College's 50th anniversary celebrations.

Mr. J. W. C. Milligan, left, making the presentation to Mr. G. T. H. Spurling on leaving the Brush Co.

Mr. Orlando Oldham, who recently returned from the U.S. with a Harvard University degree in business administration, is joining Oldham and Son Ltd. at the end of the month. He is the 26-year old son of the chairman of the company, Mr. John Oldham, O.B.E., J.P., who shares with his brothers, Mr. George and Mr. Edward C. Oldham, the managing directorship of the firm.

The Earl of Verulam, M.A., F.I.I.A., Comp.I.E.E., J.P., has been elected a director of Engineering and Lighting Equipment Co.

Under an internal reorganisation to provide the best and most economical working arrangement, the Bridport district of the South-Western Electricity Board—the smallest district in the board's organisation—will be merged into Crewkerne district as from October 1. **Mr. H. F. Castle,** at present district manager at Bridport, will be appointed assistant district manager of the larger Crewkerne district with special responsibility for the administration and management of Bridport branch, so ensuring a continuation of Mr. Castle's links with local consumers.

Just appointed representative for the Sloan Electrical Co., Ltd., for the London E.C. postal districts is **Mr. E. H. G. Brooke.** He has been associated with the industry both abroad and in this country for over 20 years, and between 1934 and 1940 and since 1949 has been a sales representative for various electrical manufacturers in the area to which he has now been appointed by Sloans.

Mr. E. H. G. Brooke

Mr. W. D. Horsley, M.I.E.E., a director and chief electrical engineer to C. A. Parsons and Co., Ltd., recently left London Airport by B.O.A.C. Comet for a business tour of Southern Rhodesia and South Africa. Our accompanying photo shows Mr. Horsley standing by the Comet jet pipes before boarding the aircraft.

Mr. W. D. Horsley awaits the plane

Allan Illingworth receiving his award from the Mayor

At Brook Motors Ltd., Empress Works, recently, the directors presented special prizes to three apprentices who had been selected as the most outstanding boys of the year. First prize of books to the value of 5 guineas went to **Allan Illingworth,** No. 8 Works; second prize to **Barry Williams,** Jig & Gauge; and third prize to **Bernard Flynn** of No. 3 Works. Allan Illingworth also gained an Ordinary National Certificate in Mechanical Engineering. Other awards of medals and certificates were made under the Huddersfield Engineers' Training Association, and of Higher National Certificates in electrical and mechanical engineering. **Mr. F. V. Brook,** chairman of directors, presided and the prizes and awards were presented by **Alderman J. F. C. Cole,** Mayor of Huddersfield. Also present were **Dr. W. E. Scott,** principal of the Huddersfield Technical College, and **Mr. R. J. Blofeld,** the Youth Employment Officer.

Previously deputy station superintendent at Kirkstall, Leeds, power station, Yorkshire Division, B.E.A., **Mr. R. C. Hodson** has been appointed superintendent there in succession to **Mr. R. J. F. Sarvent,** A.M.I.E.E., who has retired after serving in that post for the past 22 years.

Mr. H. C. Wilson Bennetts has been appointed director of sales to Allied Ironfounders, Ltd., in place of **Mr. W. T. Wren,** who has now become assistant managing director. Mr. Wilson Bennetts is also managing director of two subsidiary companies, Falco Electrical Appliances, Ltd., and Allied Steel Pressings, Ltd.

The Power Centre Co., Ltd., announce that **Mr. L. Bruce** has been appointed technical sales engineer for London and the South, as and from October 1, 1952. He will be in charge of the company's London office, and takes over from **Mr. E. K. Guy,** who has now retired after many years' service.

Mr. E. A. Joyce, who retired from the position of manager of the Travellers' Department of the General Electric Co., Ltd., in September, 1938, celebrated his golden wedding anniversary last Saturday. He was one of the founders of the Electrical Trades' Commercial Travellers' Association, of which he was chairman for three years.

Mr. J. W. Rodger, M.I.E.E., managing director of Bruce Peebles and Co., Ltd. accompanied by his wife, left in the *Empress of Scotland* last week on a six-months business tour during which he plans to visit Canada, New Zealand, Australia, Tasmania, Ceylon, India, Pakistan, South Africa, and Uganda. They are expected back in this country at the end of March, 1953. In addition to making a survey of future export possibilities, and observing at first-hand general industrial trends overseas, Mr. Rodger is to lecture on electrical power plant manufacturing techniques to specialists, leading executives, and educational authorities in the various countries to be visited, and will have group and individual discussions with existing and potential customers. **Mr. A. K. Aitkenhead,** C.A., the company's assistant secretary, is travelling with Mr. and Mrs. Rodger to Canada, the first step of their journey overseas, in connection with joint discussions to take place between constituent members of Bepco Canada, Ltd., the company's joint selling organisation in Canada.

Mr. M. W. Ramsay, B.Sc.(Eng.), A.M.I.E.E., telephone manager at Edinburgh, has been appointed to a similar post in Glasgow in succession to **Mr. W. J. Bentlett,** who has taken up an appointment in London.

Shift charge engineer at Poole generating station, Southern Division, B.E.A., since early in 1951, **Mr. J. L. House** has taken up his new duties this week as deputy superintendent at Earley power station in the same division. Another change at Poole power station concerns **Mr. P. Coueslant,** assistant shift charge engineer, who has been appointed shift charge engineer at Croydon 'B' power station, South Eastern Division, B.E.A.

Mr. G. F. Peirson, M.I.E.E., M.Amer.I.E.E., chief engineer to the Midlands Electricity Board, was re-elected president of the Birmingham Electric Club at its meeting last week. The president-elect, **Mr. G. R. Stone,** has accepted a business appointment in Canada, and Mr. Peirson has accepted the invitation to continue in office, a proposal which has now been approved by the members.

Mr. H. J. Sheppard, B.Sc., M.I.E.E., A.M.I.I.A., has been appointed section head (System Design) in the Chief Engineer's Department of the Yorkshire Electricity Board. Since vesting day he has been technical officer in the Chief Engineer's Department of the London Electricity Board and has been in charge of the Planning Section of the department for the majority of that period. Mr. Sheppard is a graduate of Birmingham University and was deputy borough electrical engineer and manager at Willesden before the nationalisation of the electricity supply industry. He expects to take up his new duties on October 1.

Mr. H. J. Sheppard

Fifty years of continuous service with one organisation is a worthy achievement and the Executive Staff of Siemens (Australia) Pty. Ltd. recently paid tribute to their managing director, **Mr. J. P. Duggan,** at a dinner held in his honour to celebrate his golden jubilee with Siemens. It was in 1902 that Mr. Duggan joined the company whose Australian branch offices were then in O'Connell Street, Sydney. In 1908 he was transferred to the Siemens Works at Stafford to serve his engineering apprenticeship, from which he proceeded to the Central Station and Power Dept., London. Returning to Australia in 1913, he was appointed assistant engineer at the Melbourne branch of Siemens, but in 1914 he was selected by the Federal Government for duties of national importance, and came to England to engage in the design, construction and testing of submarines. At the end of the war, Mr. Duggan returned to Australia as assistant manager of Siemens, Sydney, and became branch manager the following year. Since 1929 he has been general manager of Siemens (Australia) Pty. Ltd., during which time his active life has included three visits to England—the last in 1950.

Mr. J. P. Duggan

There was a large attendance of former colleagues and friends in the Industry at the memorial service to the late **Mr. A. Brammer,** general secretary of the Association of Supervising Electrical Engineers, which was held yesterday at the Queen's Chapel of the Savoy, Strand, London.

OBITUARY

Mr. W. G. Hamilton, general manager of the Llandudno and Colwyn Bay Electric Railway, died on September 18, aged 78.

Lt.-Col. H. M. Stobart, a former chairman of Richardson, Westgarth and Co. Ltd., died recently.

Mr. H. H. Wright, managing director of Wright Electric Motors (Halifax), Ltd., died on September 9, aged 82. He started that business in the late 1890's.

Mr. L. G. Hinwood, Queensland manager of the Australian General Electric Pty., Ltd., since 1929, died on September 4, aged 65.

We learn of the recent death of **Mr. A. Patterson** who has been chief engineer and manager of Bombay Suburban Electric Supply Ltd. since the inception of that company nearly 25 years ago.

Mr. Frank Wallis, M.A., M.I.E.E., who died on September 18, aged 80, was for many years with the English Electric Co., retiring from the position of assistant chief engineer at the end of 1941. He was also an active member for some time of the Council of the E.R.A., and of various B.S.I. committees.

I.E.E. 1952–53 SESSION

Local Centre Chairmen

CONTINUING our notes of last week on the chairmen of the local centres of the I.E.E., Mr. J. S. A. Primrose, M.I.E.E., M.CONS.E., sole partner in the Glasgow consulting engineering firm of Ramsay and Primrose, is chairman of the Scottish Centre of the Institution. He joined partnership with Mr. A. Ramsay in 1930, and became sole partner of the firm three years ago. He has specialised in the development of low-temperature electric heating systems of large buildings, together with the designing of steam-boiler plant for process work and central heating, ventilation and electrical work for buildings.

Mr. J. Prince, ASSOC.R.T.C., M.I.E.E., who has been manager of the meter department of Ferranti Ltd. for nearly 13 years, is chairman of the North-Western Centre. His early experience was gained in the designs offices of the Peel Connor Telephone Co. and Salford Electrical Instruments Ltd., prior to joining Ferranti in 1926, where he took charge of the meter drawing office in 1931. He became chief engineer of the Meter Department in 1935 and manager of the same department in November, 1939. He served on the I.E.E. Measurements Section Committee (London) from 1944 to 1947, and is a member of the B.E.A./B.E.A.M.A. Joint Sub-committee on Meters.

The chairman of the South Midland Centre, Dr. K. R. Sturley, B.SC., PH.D., M.I.E.E., has always been associated with telecommunications. For the past seven years has been head of the B.B.C. engineering training department at Wood Norton, Evesham, where he is responsible for the training of the technical staff for the sound and television services. He started with Marconi's Wireless Telegraph Co. as research engineer, but after a period at A.E.I.'s valve factory at Brimsdown, rejoined Marconi's as a lecturer at Marconi College, subsequently becoming assistant principal.

A naval electrical engineer has been chosen as chairman of the Southern Centre. He is Commander (L) J. C. Turnbull, M.I.E.E., A.I.MAR.E., now serving in the Naval Electrical Department, Admiralty, Bath. His apprenticeship was served with the B.T.H. Co., Rugby, and he then spent four years with Higgs Motors Ltd., one with Laurence Scott and Electromotors Ltd., and from 1935 to 1939 (when he was called up in the R.N.V.R.) he was with the Midland Electric Manufacturing Co., latterly as their representative in Yorkshire. Included in his service with the Royal Navy was two years as electrical officer of H.M.S. *Illustrious*.

For the Western Centre, Mr. A. C. Warren, B.SC.(ENG.), A.C.G.I., D.I.C., M.I.E.E., who has been chief regional engineer for the South-Western region of the G.P.O. since 1944, is the new chairman. Unfortunately, we are unable to reproduce his portrait. He first entered the P.O. Engineering Department in 1920, initially in the Radio Branch, and in 1935 became engineer-in-charge at the Rugby radio station. After a period as assistant engineer of the South-Western district, he was telephone manager at Bristol from 1937 to 1944.

Finally, the Northern Ireland Centre has as its chairman Mr. H. Weston, M.I.E.E., who has been superintendent of power stations to Belfast Corporation for the past 14 years. He originally joined the staff of the Belfast Corporation in 1923 after a short period with Cleveland and Durham Electric Power Ltd.

Mr. J. S. A. Primrose *Mr. J. Prince* *Dr. K. R. Sturley* *Commdr. Turnbull* *Mr. H. Weston*

WEST of the ROCKIES

British Columbia Power Commission's Output up 41%

BRITISH COLUMBIA has one of the largest untapped sources of hydro-electric power left in the North American continent. Installed capacity is now estimated at about 15% of the potential 11,000,000 h.p., but with a number of large concerns interested, there is likely to be considerable development in the near future. The largest single project now under construction is the Aluminium Co. of Canada's 500,000 h.p. installation in the Nechako Valley for aluminium smelting, with provision for an ultimate capacity of 1,600,000 h.p. In addition, there is the British Columbia Electric Co. which, with its subsidiaries, controls an extensive system of public utility services in the province; the East Kootenay Power Co., and the British Columbia Power Commission, all with developments in plan which should provide immense opportunities for British manufacturers of electrical equipment.

These notes concern the British Columbia Power Commission whose annual report covering the year to the end of last March, indicates the extent of the progress being made in its area, which is split up into 25 power districts. That commission only commenced operations in August, 1945, with the acquisition of five electricity undertakings serving 11,906 consumers. But by March 31 last, that total had risen to 45,912. Stress is made in the report on the increased consumption over the past year. For residential consumers, the rise was 20% to an average monthly consumption of 151 units, and for commercial users 13% with a monthly average of 518 units. At the same time, the average charge per unit dropped from 3·3 to 3·1 cents for domestic consumers and from 3·2 to 2·8 cents for commercial.

41·6% Increase

With a 23·4% increase in generating capacity, the total output of the Commission at 378·7 million units was 41·6% higher than for the previous 12 months when 4·5% of the total was purchased. Now the Commission supplies in bulk to several large consumers, including the British Columbia Electric Railway Co. In fact, revenue from industrial loads was 65% of the total expenses for the year under review.

In view of the rapid expansion expected, particular attention has been given to the development of sources of power to meet future demands. The principal source of power for Vancouver Island is now the Commission's John Hart plant on the Campbell River. Here four 28,000 h.p. turbines are now in service and it is proposed to add two more sets.

Future Schemes

The year under review also saw the operation of the Commission's second major hydro-electric development—the 22,000 h.p. plant at Whatshan—and within the last few months the Clowholm Falls hydro plant, to serve the Seechelt Peninsula, has also been put into operation. For supply in its more remote areas, the Commission has 11 diesel power stations.

In the forward plans, preliminary surveys have been made of a number of power sites, notably on the Spillimacheen River and at Horsethief Creek in the Columbia Valley, and of Kokish River on Vancouver Island. Among the transmission projects, preliminary design has been carried out for an extension of the 132 kV line from Nanaimo to Harmac on Vancouver Island, where work has also commenced on augmenting the 60 kV system.

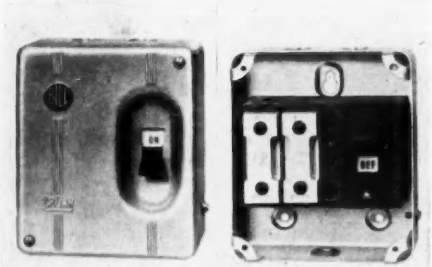
Clowholm Falls, the Commission's latest h.e. development

The BUYER'S *Column*

Bill A.C. Switchgear and Splitters

THE Crown single pole and neutral switch-fuses and switch splitters introduced by BILL SWITCHGEAR, LTD., Aston Lane, Birmingham 20, are specifically designed for a.c. circuits. The d.p. switch is of an entirely new design and incorporates the "slow break" action. Its movement is fitted with an interlock for safety in fuse replacement and a two-colour "on and off" indicator is fitted to the switch handle.

The fuses are of the arc-damping type arranged for single pole and neutral. Fuse carriers fitted with H.R.C. cartridge fuses, are offered as an alternative and are interchangeable. The cartridge fuse links are to B.S. 1361. Space for spares is provided.



The "Crown" units by Bill Switchgear are well designed

Wiring facilities in the unit are simple and ample room is allowed for the cables for top, bottom or back entry. Space is allowed at the back of the switch base for through or back wiring. Cables can be split inside the cover after entry. Provision is made for earth continuity where required.

The metalclad switchfuse and switch splitter are fitted with knockout smooth bore bushes, allowing for conduit or rubber cable.

When ordered for "H.R.C." fusing, each unit is supplied with a spare cartridge. All arc-damping rewireable type fuses are suitably wired ready for use.

Ediswan and Lighting

NEW type cold cathode lighting fittings are being produced by THE EDISON SWAN ELECTRIC CO., LTD., 155 Charing Cross Road, London, W.C.2.

These fittings, 10 ft. long overall, employ three or four standard type 9 ft 6 in. long cold cathode fluorescent lamps normally operated at 120 MA current. The tubes are available in a variety of colours most popular being natural, medium and warm white.

H.P. Terms for E.E. Appliances

AN announcement by THE ENGLISH ELECTRIC CO., LTD., Queens House, Kingsway, W.C.2, states that arrangements have now been completed with the Mercantile Credit Co., Ltd., which will allow authorised dealers to offer their customers hire purchase facilities for their refrigerators and washing machines similar to those already available for "English Electric" T.V. sets.

Initial payment on the 76A refrigerator is £52 19s. 10d., the balance of hire purchase being payable either over a period of twelve or eighteen months. The same terms of extended payment are offered for the washing machine with a down payment of £29 13s. 5d.

Tricity's 528 Cooker

PROUD producers of their new Model 528 cooker, TRICITY COOKERS LTD., 109 Kingsway, W.C.2, emphasise that it is designed as a slightly smaller and more economical standard size cooker and not as another addition to the "baby" range.

Because they know there is a great demand for a reliable family cooker at a price which will not prejudice potential buyers when considering installation costs and supply authorities concerned with peak-load problems, Tricity have brought out their masterpiece, the 528.

Attractive in appearance, the 528 is smaller yet has adequate cooking capacity. There are two boiling plates, one a 6½-in solid G.E.C. (or Metrovick Radiant in lieu at 24s. extra), the other a 10½-in. by 8-in. 1,800 W grill boiler, whilst the oven (10½ in. by 11½ in. by 12½ in deep) is heated by elements rated at 1,150 W.

Total loading is 3,950 W but if the Master Selector Switch is fitted (at no extra charge) the total loading is reduced to 2,950 W by permitting the simultaneous use of any two of the elements only. With this loading it is possible to install the cooker in the 13 amp ring main circuit, obviating the need for extra wiring. Including accessories, splash plate, deflector plate, grill pan, grid, two-rod shelves, baking pan and recipe book, the price is only £20 15s. There is no purchase tax.

Tricity's 528, although smaller, cooks a full family meal with ease

Scemco's New Trough Fitting

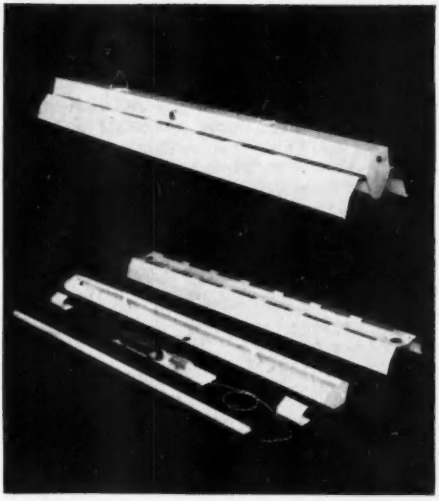
THE I.T.S. 52 unit just introduced by SCEMCO, LTD., Soho Square, W.1, is a new streamlined lightweight fluorescent trough fitting with removable reflector.

Finished with cream exterior and white interior the reflector is designed to afford easy removal for maintenance and to provide maximum downward light, whilst permitting upward illumination through the slots. The whole fitting can be mounted in continuous runs.

The control gear and the fitting, we understand, complies with M.o.W. and M.o.S. specifications No. 12, 1950, and that quantities have already been ordered by Government departments.

Price of the complete unit is £6 6s. for the 5 ft, 80 W type.

Scemco's I.T.S.52 unit 'exploded' to show components



The Standard Startall

DESIGNED for operation from mains supply, the "Standard Startall" unit is designed to start the engine of any type of petrol-engined motor vehicle in a couple of minutes, even when the batteries of the vehicle are flat.

To be demonstrated publicly at the forthcoming motor vehicle Shows, the unit, marketed solely by G. S. L. PRODUCTS, LTD., Western Avenue, Greenford, Middx., was designed and produced by Standard Telephones and Cables, Ltd.

Light in weight and compact, the unit is mounted on rubber wheels and is manœuvred easily by the curved rubber grip handle. Switching for either 6 V or 12 V working mains switches and an ammeter with push-button control are included in the equipment which, painted bright yellow with black fitments, is priced £48 10s. Besides providing a convenient source of power for starting, it offers battery-charging facilities and a l.v. supply for component testing.

Operation is simple. The equipment is connected to the car battery, where it replaces the power normally available from the battery. An automatic cutout is incorporated to prevent damage to the batteries. If the unit is left coupled it automatically cuts out at a predetermined interval during which time the battery will have received a substantial charge.

Crabtree Price Reductions

SUBSTANTIAL reductions, ranging from 15% to 5% in the percentage increases formerly to be added to the price of products, were announced recently by J. A. CRABTREE AND CO., LTD., Lincoln Works, Walsall.

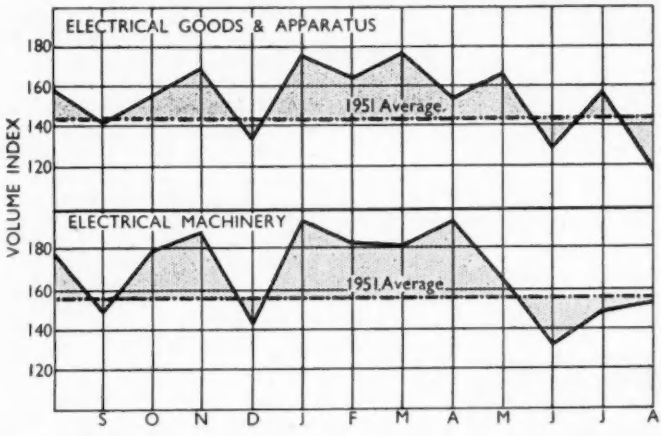
These reductions in many cases bring the prices down to the figures listed in price list No. 193. A summary of the position is: 5-amp "Lincoln" switches, shown on pages 16 to 21 and 90; switched socket-outlets, all-round pin types, shown on pages 64 to 73 and 93; plugs, all-round pin types, shown on page 74; ceiling roses, all types, shown on page 82; lampholders, "Lincoln" types, shown on page 83; switch and fusegear, all types, shown on pages 98 to 120—all list price without increase.

Five-amp "Lincoln" flush switches, assemblies and sundries, shown on pages 48 and 49, are now list price plus 7½%; whilst products on all other pages are list price plus 10%.

Automatic control gear of all types, listed on pages 13 and 14 of price list No. 190, is still quoted at list price plus 5%. All prices effective on and after September 22.

The Startall will prove invaluable to operators of large vehicle fleets

EXPORTS AND IMPORTS



EXPORTS VOLUME INDEX

Exports of electrical goods and apparatus fell sharply during August under the combined effects of seasonal influences and various countries' import restrictions. The E.T. index of volume shows that the amount exported was only 119% of the 1947 monthly average, the lowest individual monthly figure since April, 1950. The value of the goods concerned was £7,496,344.

A better story is shown by the index for electrical machinery, which rose to 153, again on a basis of 1947 as 100%. This is, however, still below the level maintained during the earlier months of the year. The value of the equipment concerned in this case was £4,741,434.

A SERIOUS drop in the value of electrical goods exported last month, compared with the corresponding figure for July, is shown in the monthly Board of Trade returns. At £12,614,653 the total was £2,131,436 below the July figure. The decline is to some extent due to the fewer working days (25 as against 27 in July). It will be seen that the reduction affected all electrical goods except accumulators and the convertors, transformers and switchgear group. Of the latter, switchgear and switchboards alone accounted for £1,517,010 and transformers for £831,311 of the total, both higher figures than for the previous month. Exports of complete electric washing machines were valued at £231,505 for August against £317,633 in July.

Description	Exports Value Month of August			Imports Value Month of August		
	1950	1951	1952	1950	1951	1952
	£	£	£	£	£	£
Telegraph and Telephone Wires and Cables						
Submarine	473,588	106,330	14,489	—	—	—
Other	715,234	561,219	453,388	—	—	—
Rubber Insulated	349,552	580,241	466,755	—	—	—
Insulated, other than Rubber	603,106	1,030,600	1,075,302	—	—	—
Wireless Apparatus, including Valves ...	1,747,555	2,131,525	1,934,088	209,345	280,773	307,996
Telephone and Telegraph Apparatus... ...	1,300,524	1,329,106	1,215,508	—	—	—
Electric Lighting Appliances, Accessories, Fittings and Parts:—						
Filament Lamp Bulbs	119,857	147,272	73,099	19,958	13,269	6,010
Other Descriptions	291,105	430,088	395,219	17,233	59,077	43,238
Batteries (primary)	117,391	185,589	155,680	—	—	—
Accumulators, Portable	191,403	351,031	303,450	—	—	—
,, Stationary	103,502	141,493	32,465	—	—	—
,, Parts and Accessories ...	68,680	67,143	27,836	—	—	—
Electrical Cooking and Heating Appliances...	269,271	455,508	238,801	—	—	—
Ammeters, Voltmeters, etc., and Parts ...	107,671	160,485	108,259			
House Service Meters	111,280	94,966	96,784	24,181	42,915	49,401
All Other Instruments	115,864	106,007	108,784			
Electro-Medical Apparatus	44,131	36,528	31,922	—	—	—
X-Ray Apparatus, etc.	80,890	154,872	84,680	13,353	60,166	18,182
Insulating Materials	116,892	213,137	108,501	—	—	—
All Other Articles	506,165	613,550	571,334	114,549	125,230	83,485
Total of Group	7,443,661	8,896,690	7,496,344	398,619	581,430	508,312
Electrical Machinery:—						
Generating Sets (Diesel)* Not exceeding 200 kW	1,102,883	514,260	296,177			
,, ,, ,, Exceeding 200 kW...	218,942	126,432	122,910	11,628	45,057	46,627
Other Generating Sets	459,946	137,512	174,089			
Generators minus Prime Movers, and Parts†	245,312	792,915	798,697			
Motors	716,359	883,205	698,531	46,332	35,165	28,835
Convertors, Transformers, Rectifiers, Motor Control Gear, Switchgear, other machinery	1,784,585	2,164,285	2,651,030	13,517	22,943	40,953
Fans, Electrically and Power Driven ...	147,503	196,601	173,253	—	—	—
Vacuum Cleaners or Electrically Operated Appliances	293,626	450,810	203,622	—	—	—
Total Appliances and Machinery ...	12,412,817	14,162,710	12,614,653	470,096	684,595	624,727

* 1950 Figures include generators minus prime movers. † 1950 Figures for parts of generators only.

The WEEK in NEWS

Large U.K. Delegation attends I.E.C.

Next Meeting in Yugoslavia in June, 1953

THE meetings of the Committees of the International Electrotechnical Commission which took place at Scheveningen, in Holland, between September 3 and 13 were again outstandingly successful. Some 420 delegates representing 19 countries attended, one of the largest delegations being that from this country, which numbered 61. Twenty-eight committees held meetings lasting from one to five days, and among the numerous technical subjects discussed were the dimensions of electric motors, methods of declaring efficiency of rotating machinery, graphical symbols, turbo-alternator sets, voltages and mercury arc rectifiers.

At the Council meeting towards the end of the series of meetings, Dr. H. S. Osborne, President of the U.S. National Committee, was elected President of the Commission. He succeeds Dr. Max Schiesser of Switzerland. A British member, Dr. P. Dunsheath, was re-elected treasurer. It has also been announced that an invitation from the Yugoslav National Committee to hold next year's series of meetings in that country has been accepted. The decision was taken following an assurance that delegates from all member countries would be able to obtain visas. The 1953 meetings will be held in June.

At the banquet given by the Netherlands Committee, Dr. Schiesser praised the arrangements made for the smooth conduct of the conference, and emphasised the importance and accomplishment of the Commission's activites. The programme included several visits, one of which was an inspection of the building of dams now in progress for the reclamation of Zuyder Zee.

A Bill to Form New Scottish Authority?

ON many occasions within the past 18 months statements have been made suggesting the inauguration of a Scottish Electricity Authority, which would take over from the B.E.A. the area boards north of the border. The latest proposal asserts that a Bill will probably be introduced in Parliament early next year, which would put Scotland's electricity supply on a "home-rule" basis. One provision it is stated would be a stronger tie-up between the North of Scotland Hydro-Electric Board and the South-West and South-East Scotland boards. This apparently, would be achieved by a joint planning body to integrate the efforts of the three organisations but otherwise the existing autonomy of the Hydro Board would remain. These proposals are made in "We Shall Win Through", the latest Unionist Party progress report.

SCOTTISH MEETING TO CONSIDER RIDLEY REPORT

THE Scottish Fuel Efficiency Committee is calling a special meeting to consider the recommendations of the Ridley report. This body was not represented on the Ridley Committee, and the omission has been the subject of protest in Scotland. In calling this meeting, the chairman, Sir Patrick Dollan, stated that many of the Scottish proposals had been accepted, but the report did not call for reforms on a semi-compulsory basis. As an example the recommendation for a co-ordinated policy for the fuel industries had been accepted only on a voluntary basis, whereas Scotland had favoured a National Trust with executive co-ordinating powers.

Sir Patrick said that care would be taken in future to insist that Scotland was represented on whatever new organisation was set up to discuss similar matters as conditions were different from those in England and Wales. He claimed that Scotland was a long way ahead of other areas in Britain in efficiency and wished to maintain that leadership.

The First Half-Century

It has often been prophesied that the right to use the ether would some day become an international question, but one hardly expected that diplomacy would discover the existence of that entity for a few years yet. If, however, the German correspondent of the *Standard* be rightly informed, the activity of the Marconi Wireless Telegraph Co. in establishing stations, and the contract it has entered into with Lloyds, have aroused the susceptibilities of Germany, which has invited England, France, Russia, Italy, Austria and the United States to send delegates who may pave the way for a Convention on the question. The Convention is to lead to an International Conference and the Conference to an International Treaty, which shall settle the terms on which international wireless telegraphy may be permitted.—*From our issue of September* 25, 1902.

OFFICIAL PUBLICATIONS

B.O.T. DIRECTORY. *Guide to functions of the Board's various sections.* H.M.S.O. 9d.

OVERSEAS ECONOMIC SURVEY. *Paraguay* (see page 562). H.M.S.O. 2s.

HUMAN RELATIONS IN INDUSTRY. *Report of Conference held in London in March.* H.M.S.O. 3s. 6d.

FUEL RESEARCH TECH. PAPER (No. 56). *Preparation of Standard Sand used for Determining Agglutinating Value of Coal, pub. by D.S.I.R.* H.M.S.O. 1s.

U.N. CONSERVATION AND UTILISATION OF RESOURCES. Vol. 3.—*Fuel and Energy Resources.* H.M.S.O. 22s. 6d.

EXPORT OF GOODS (CONTROL) AMENDMENT ORDER, 1952. H.M.S.O. (*see page* 564)

FACTORIES (TESTING OF AIRCRAFT ENGINES, ETC.) *Revocation Order and Special Regulations. S.I.s* 1688 *and* 1689. H.M.S.O. 2d. and 4d. resp.

Local Authorities Quiz on Electricity

THE N.W. Electricity Consultative Council has arranged a conference for representatives of local authorities which is to take place at Blackpool tomorrow afternoon. It is being held at the suggestion of a number of local authorities with the object of affording councillors the opportunity of putting their problems before electricity officials.

1953 Electrical Exhibition at Earls Court

IT has now been announced officially that a National Electrical Engineers Exhibition will take place during Coronation year. Rumours to that effect which have been circulating, and which we have recorded in these columns on May 22 and more recently in our August 14 and September 4 issues, have now been confirmed. The venue will be Earls Court, in the West Brompton Hall, and it is to take place between March 25 and 28.

The organising committee will be the same as this year's, and the hon. secretary is Mr. P. A. Thorogood. About 57,000 sq. ft. of space is available and we understand that 60 manufacturers have already given notice of their intention to exhibit.

Main features of the Coronation Show will be an Illumination Hall and a Cooker Avenue. It is also proposed to present two medals for the most outstanding 1953 labour saving devices, one for the electrical industry and the second for a domestic appliance.

Distillation Plant Ordered by Kuwait

AN order for sea water distillation plants to provide a million gallons of fresh water daily for Kuwait, the oil state in the Persian Gulf, has been placed with the British company of G. and J. Weir, Ltd. The plant will comprise ten sets of triple effect horizontal evaporators each with its own distilling condenser and pre-heater. The installation will be located at Shuwaikh.

B.I.C.C. RECEIVE SUPER GRID ORDER

ANOTHER contract for a section of the proposed British Super-Grid has been placed. It was announced by British Insulated Callender's Construction Co., Ltd., last week that an order has been received by them for the construction of the 275 kV double circuit overhead line from Staythorpe to Elstree, a route of approximately 114 miles. Twin S.C.A. conductors on each phase are to be used, each wire with a cross sectional area of 0·4 sq in copper equivalent. Towers will be standard type and to the design of Blaw Knox Ltd. Orders for the steelwork have been placed with Painter Bros., Ltd.

13,730,000 Households Are Using Electricity

ONCE again the Hulton Readership Survey, published last week by Hulton Press Ltd., provides us with an admirable analysis of electricity consumers in the country. The total proportion of persons of all classes who have electricity installed in their homes is 88%, which figure comprises 69% who have both electricity and gas and 19% with electricity only. Of the remaining 12%, 9% have gas only and 3% neither gas nor electricity. These proportions, it is stated, show virtually no difference from those shown in the 1950 edition of this survey. There was only an interim survey published last year. The estimated number of households using electricity has been given as 13,730,000, which figure, of course, corresponds with 88% referred to above.

Judging from the photograph reproduced here the N.W. Division of B.E.A.'s claim that the floodlighting and colourful illuminations decorating Ribble power station compared favourably with anything Blackpool could produce, appears justified. The picture was taken during Preston's 1952 Guild celebrations. The station also staged a public exhibition of working models, diagrams and photographs. Other pictures of Preston's lights specially installed for the celebrations appear on page 563

An admirable lighting scheme which truly enhances the appearance of this modern Bristol shoe store

Lighting Scheme for Modern Store

THE recently opened Dolcis shoe store in Bristol must surely be counted among the examples of good, modern, well-planned and well-lighted stores. As can be seen from the accompanying illustration there is a remarkably clean, spacious and generally pleasing appearance, due in no small measure to the lighting installation.

General lighting for the shopping area has been provided by cold cathode lamps housed in coffers in the false ceiling. This has been supplemented by hot cathode lighting emanating from numerous wall displays and internally silvered tungsten lamps in Conaliter fittings for the display tables. Tungsten lighting has also been used wherever merchandise is to be selected, as this form of lighting is generally accepted as the best for leather goods. On the store's first floor the ceiling lighting has been combined with cold cathode tubes placed in suitable recesses around the perimeter. The installation was carried out by Courtney Pope (Electrical) Ltd.

Renovations at Hull Docks

EXPENDITURE of some £950,000 for the installation of modern cranes and electrical equipment at Hull docks, has been authorised by the British Transport Commission. Much of the existing equipment is now obsolescent and under the new scheme will be replaced by 45 six-ton electric cranes. The proposed alterations include a change-over from d.c. to a.c. supply. The cranes will have a working radius of 70 ft and a lifting speed of 240 ft a minute as well as fittings for grab working. Six 10-ton cranes with bucket elevators now used for grain discharge will have to be equipped for a.c. operation, in addition to 150 motors in the grain silo. The complete scheme will probably take between three and four years.

IDEAL HOME OPENS IN BIRMINGHAM

THE Midlands Ideal Home Exhibition, which normally attracts some 500,000 people, was opened at the Bingley Hall, Birmingham, yesterday, by the Lord Mayor. It will remain open to the public until October 18. Central feature of the exhibition is the Ministry of Housing's 'People's House,' completely furnished. Exhibits generally have been divided into six main sections, prominent among which are radio and TV sets and all manner of labour saving devices and electrical equipment.

EXEMPTION FROM ENTRY EXAMS

A REVISED list of requirements laid down in terms of the General Certificate of Education for candidates seeking exemption from examinations giving entry to professional studies, has been issued by the Ministry of Education (Circular 227). It follows consultations which have been taking place between the Secondary Schools Examinations Council and the professional bodies concerned, among which were the prominent electrical organisations.

One addition to the original leaflet is the acceptance of the Certificate by B.E.A.M.A. for student apprenticeship, provided passes are obtained at ordinary level in maths, English and a science subject, with evidence of a broad general education. These hold for entries at the age of 16. For entry at 17 and 18, at least one of the subjects must be taken at advanced level. The I.E.E. and similar Institutions' requirements remain as before, as also do those of the Institution of Mechanical Engineers except that in the latter case a pass at ordinary level in English will suffice for exemption from Section A of the Associate Membership Exam instead of a pass at advanced level.

LEEDS CHOSEN FOR TEACHERS' CONFERENCE

A ONE DAY conference on the Teaching of Electrical Housecraft is to be staged by the E.A.W. for the first time in Yorkshire. It will take place at the Training College of Housecraft in Leeds on November 15. Previous conferences of the same kind have been held in the Midlands and S. Wales and longer conferences in Gloucestershire, Glasgow and London. It is hoped that this introductory course in Yorkshire will precede further regional courses of this nature. Main subjects to be covered next month are the use and care of domestic electrical appliances and laundry equipment, and the teaching of electrical housecraft in schools.

Recent visit to Horsley Towers (Surrey) afforded excellent opportunities of seeing facilities provided by the B.E.A. for training their employees. Shown here are students at a demonstration of temperature and pressure during a course for boiler house operatives. Since inception there have been 131 courses at the two B.E.A. Residential Centres, with 3,756 students

FUTURE OF TRAMS IN SCOTTISH CITIES

EDINBURGH'S Civic Amenities Committee has approved a recommendation that the city's tramway system should be abandoned within the next three or four years, and that it be replaced by buses. They will seek confirmation of this decision from the Council when it meets today. Consideration of the city's transport and the relative merits and demerits of trams, motor buses and trolley buses has been going on for some time now. Some months ago 25% of the trams were in fact replaced by buses. Future policy as regards tramways was considered by a special sub-committee and it was their recommendation that the Civic Amenities Committee has now approved. In the course of last week's discussion, an argument in favour of trams was that eventually electricity was likely to be one of the cheapest means of locomotion.

On the west coast of Scotland a report to the sub-committee of Glasgow's transport committee states that the electrically powered vehicle has advantages over the diesel bus as a result of the cheap electrical energy produced at Pinkston. Glasgow would have to operate trams for some time because of the possibility of replacing some 100 vehicles. Assets of the tramway were so great that replacement plans would have to be spread over a long period.

Overhead Lines Should be 25ft. High

CONCERN over the low height of overhead lines has been expressed in a resolution approved by Berkshire's N.F.U. Executive. The resolution was put before the Executive by the Maidenhead branch, and was prompted by a recent fatal accident when an elevator touched cables which were 2 ft 6 in. higher than the stipulated height. The Executive concluded that if fatalities could occur when lines were above the required minimum height, that minimum should be increased. They agreed that although it would be impracticable to alter existing lines, new ones or renewals should be strung at least 25 ft from the ground at the lowest point.

ELECTRICAL FUTURE OF PARAGUAY DEPENDS ON FINANCE

TRADE in general to Paraguay is not large, both imports and exports being limited largely by the small population. The desire for imported goods has been stimulated by a recent trend from country to town. These facts are included in the Overseas Economic Survey of Paraguay just published by H.M.S.O. The U.K. enjoys an excellent reputation for quality in her manufactured goods and we note that as far as electrical items and apparatus are concerned exports rose in value from £8,335 in 1950 to £58,065 last year.

It is now known that considerable potential sources of hydro-electric power exist in Paraguay, but lack of capital and small industrialisation have prevented schemes being carried out. The Point Four Plan includes a study of hydro-electric schemes, but agricultural production and communications must take preference. Even if H.-E. power is found feasible and advantageous a loan would have to be negotiated first. Likely electrical requirements in the country are machinery and equipment for generating plant; electrical fittings generally; 12 V and 6 V accumulators; radio sets and refrigerators.

Electrical Display at Shrewsbury

A THREE-DAY exhibition of wireless, TV, and electrical domestic appliances was staged by the Midlands Electricity Board at Shrewsbury last week. It was dominated by an intricate model of the Alexandra Palace television mast, and the display was packed with radio and TV sets of all makes. Biggest attraction appeared to be the historical section where many of the stages in the development of the modern set were shown, beginning with Marconi's transmitter of 1901. The domestic appliance section showed almost everything from razors to refrigerators, a large model of the latter showing its inner workings.

Review of Employment During 1951

A REVIEW of the work of the Ministry of Labour and National Service during 1951 is contained in the Ministry's annual report for that year, published last week. Probably the most important figure, that on which much of this Government Department's work depends, is the total working population of the country, which last autumn reached á peak of 23,500,000. Of this total, those engaged in civil employment numbered 22,221,000, a rise of 116,000.

During the year under review deferment was granted to 11,300 students wishing to go up to universities, technical colleges and the like. In addition 886 graduates obtained deferment to undertake further studies in post-graduate research. The number of deferments granted to apprentices and those training for professional qualifications numbered 149,900 on October 5 last.

In the section devoted to employment services we note that the Technical and Scientific Register filled 2,569 vacancies during 1951.

Deferred Call-up Plans

SKILLED workers in important engineering export industries may be granted deferment of call-up under new arrangements announced by the Ministry of Labour. Engineering firms which train apprentices may ask that they shall not be required for National Service for two years after the completion of their apprenticeship. The firms must, however, have a substantial export trade or the prospects of one unless their contributions are indirect. The workers retained must be employed on export work, be necessary for that work, and agree to deferment. Nearly all highly skilled occupations are covered.

Among categories of exports affected are heavy electrical plant, including switchgear, transformers and w.t. boilers, domestic refrigerators, electronic equipment, portable power tools, cranes and conveyors, mining machinery and railway locos.

Television Production in the United States

DETAILED information on the production methods employed by American firms making television sets is given in a report recently prepared for the Mutual Security Agency of the U.S.A. This is one of a series of "case studies" which are designed to provide managements with yardsticks for comparison of their own and U.S. plant performance. In particular, they are not a substitute for industry schemes. These reports are being published in this country by the British Institute of Management, Management House, 8 Hill Street, London W.1, at a cost of £1 each. Amongst other reports ready for distribution is one on fluorescent lighting fittings.

SIX-WEEK LIGHTING COURSE IN GLASGOW

LATEST announcement concerning Illumination Design Courses scheduled for this winter comes from Glasgow, where a series of weekly lectures opens at the Lighting Service Bureau at 29 St. Vincent Place, Glasgow C.1, on October 15. Two lectures will be given each Wednesday evening. Opening remarks on the first day will be followed by "Light, Lighting Terms and Light Control." On October 22 the lectures will be on "Light and Vision" and "Colour," and on November 12 on "Schools and Offices" and "Homes." Talks on other evenings will be on "Lamps," "Illumination Design" and "Industrial Lighting." Tickets may be had from Mr. J. Roper at the above address.

DISPLAY OF MODELS

ONCE again the Model Engineer Exhibition is nearly with us. It opens on October 20 at the New Royal Horticultural Hall, Westminster, and the inaugural ceremony this year is to be performed by H.R.H. the Duke of Edinburgh.

Viewers are assured of another fine array of exhibits. As far as the electrical modeller is concerned, the marine tank will be the centre for radio-controlled ships, and prominent among other items on view will be an electronic organ weighing 2 cwt.

Floodlighting of the Guildhall and gardens during Preston's Guild celebrations carried out by Siemen's Electric Lamps and Supplies Ltd., one of the town's leading industrialists

Prospects for Next Winter in the Midlands

WHILE the recent spell of cold weather has been giving us a grim reminder of the approaching winter, the E. Midlands Division of B.E.A. made a further effort to clarify the present position as regards electricity supplies last week. Mr. R. A. Bartlam, system operation liaison engineer at Nottingham, told the area's Peak Economy Committee that there was plenty of electricity for all outside the peak hours. He emphasised the need for economy during the peak, but stressed the abundance of supplies at other times.

Speaking of the winter, Mr. Bartlam said the overhaul programme was up-to-date and the installation of new plant was proceeding satisfactorily. The large increase in capacity would not, however, bridge the gap between supply and demand. The deficit was expected to be about 1,000 MW in average weather and 1,600 MW in cold weather. He added that those figures represented an improvement of some 800 MW on last winter, and accounted to some extent for the reduction from 20% to 10% in load-spreading. The committee's policy will be to encourage the transfer of consumption from peak to off-peak hours.

NEW AMPLIFIERS FOR CANADIAN M.P.s.

THE sound amplification system provided in the Houses of Parliament in Westminster, is to be copied for the Canadian House of Commons, Ottawa. The equipment for Canada is to be supplied by Tannoy on a rental basis and it is understood that the cost will be about £15,000. In the light of experience gained since the installation in Westminster, certain improvements will be incorporated. One of the differences is expected to be that the Canadian Chambers will be divided into 23 zones, each with its own microphone, instead of the 14 zones in London. At Ottawa two other systems were tried but were found not quite suitable. The new equipment was shipped to Canada last week.

Export Licence Needed for Stampings

THE Board of Trade has issued an order making some alterations in export licensing control. One of the changes is that as from yesterday (Wednesday) licences are required for specified electrical stampings, laminations of alloys containing over 20% of nickel and core assemblies composed of those articles.

The new Birmingham offices of Metropolitan-Vickers Electrical Co. and Edison Swan Electric Co., at 10-12 Hospital Street, were formally opened a few days ago. Our picture shows Ald. W. S. Lewis, chairman, Midlands Electricity Board, performing the ceremony, with him are Mr. W. A. Coates of Metrovick (with pipe) and Mr. H. Butterworth of Ediswan (left)

NEWS IN BRIEF

Revised syllabus and regulations for Examinations in Sales Management have just been issued by the I.S.M.A.

A Mutual Aid Scheme has been drawn up by the Ministry of Works and building industry distributors to assist contractors when the completion of work is held up through lack of essential commodities. The scheme, which covers all items including electrical, is not intended to cope with general shortages, but only those shortages which will delay occupation of an otherwise completed building.

The Association of Consulting Engineers has just published its list of members for 1952. It is available to members at 1s. and to non-members at 1s. 6d.

We hear that E.D.A.'s "Electric Cookery Book," published last June, is to be transcribed into Braille by the National Institute for the Blind.

The 120th branch of E.A.W. has been inaugurated at Urmston. We hear also that yet another branch of E.A.W. has been formed at Chorley (Lancs).

Institute of Personnel Management has arranged a five-day course on industrial relations to be held at Regent Hotel, Leamington Spa, between October 26 and 31.

Liverpool Electric Cable Co. once again defeated its associate, Frederick Smith and Co. of Salford, in their annual bowls competition.

A party of 40 from the Electric Construction Co., Ltd., recently took the opportunity afforded them of touring Frankley pumping station, Northfield, Birmingham, where the company's equipment is used.

Electric Supply News . . .

B.E.A. Supplies

In the month of August last, the total of units sold by the B.E.A. to all customers was 3,631 m., a decrease of 2·8% on the corresponding month of 1951. Adjusted to normal weather and standard working days, this decrease becomes 0·7%.

Individual area board purchases from the B.E.A., together with sales made directly by the Authority, are given in the table below. For areas in which industrial consumers took more than half of the total energy sold, there was a 5·4% decrease on last year; for other areas, a 2·1% increase.

Board	August total m. units	% inc. or dec. in August 1951
London	313	−0·4
South Eastern ...	197	+2·5
Southern	232	+4·5
South Western ...	118	+3·8
Eastern	322	+2·4
East Midlands ...	278	−1·6
Midlands	354	−2·6
South Wales ...	226	+0·7
M. and N. Wales ...	226	−9·6
Yorkshire	378	−0·2
North Eastern ...	236	−9·4
North Western ...	414	−12·9
S.E. Scotland ...	84	+0·9
S.W. Scotland ...	192	−3·7
Direct Sales ...	61	+1·6
Grand Total ...	3,631	−2·8

Eire

The Cathaleen Falls hydro-electric station of the Electricity Supply Board is to be formally inaugurated on October 1. The first of the two 22,500 kW generating sets at the station were put into operation last November.

Lanarkshire

Plans have been submitted by the B.E.A. to the Lanark County Council for the proposed new o.h. transmission line which will run from Carlisle to Clyde's Mill power station, Camouslang.

North of Scotland

A distribution scheme, to cost £750,000, to provide electricity in outlying districts in North-East Aberdeenshire and Banffshire, has been outlined by officials of the North of Scotland Hydro-Electric Board. Known as the Strichen Scheme, the development will cover an area of 450 sq. miles bounded roughly by the North Sea and lines joining Macduff, Turriff, Old Meldrum, Ellon, and Newburgh, and containing potential consumers in 2,400 farms and 2,000 other premises. Balfour, Beatty and Co., the contractors, have already started on survey work and materials have been ordered. The area has been divided into three sections and it is hoped to keep actual construction work going from the middle of next year until the scheme is completed in 1955 or 1956. For this reason the board is anxious that all concerned should take advantage of the scheme, but so far acceptances are between 60% and 70%. Each potential consumer is being asked to guarantee a minimum revenue calculated at £3 per habitable room a year plus £3 per 1,000 sq. ft. of steading area for farms, for a period of at least seven years. Shops and business premises will be dealt with similarly, but on a different basis of assessment. Mr. A. Clerk, manager of the Board's North Caledonia Area, explained that the scheme will involve the construction of 20 miles of o.h. transmission lines from Rothie-Norman, where they will tap the Keith to Aberdeen 132 kV line to Strichen. At the latter another substation will be built. About 750 miles of mains and 1,000 transformers will be required. The bulk of the electricity will be obtained from the Glen Affric and Fannich schemes.

Yorkshire

Up to the end of July last, approximately 40% of farms in the area of the Yorkshire Electricity Board had been given a supply of electricity, the Consultative Council was told last week. Since March, 1949, when there were 13,791 farms of over five acres without electricity, 2,498 farms have been connected. Of the 393 villages without electricity in Yorkshire, 194 were connected during the same period. Between April 1 and July 31 this year, 4,880 houses on estates and 658 other houses were connected, compared with 4,619 on estates and 407 others during the same period last year. The number of consumers supplied by the Board now totals 1,240,999.

LIGHTING SCHEMES

Barnes.—At the recent borough council meeting it was reported that a letter had been received from Wandsworth B.C. stating that they were making application to the M.o.T. for authority to improve lighting in their area in Upper Richmond Road, and in order to secure a common standard of lighting throughout that road they asked Barnes to install similar lighting. Barnes B.C. rejected the offer as inopportune in view of economy cuts in other lighting schemes in the borough.

Consett.—The U.D.C. is considering plans with the North Eastern Electricity Board for extending street lighting from Leadgate to Iveston.

Didcot.—The Parish Council has approved a new lighting scheme, costing £2,153, which will replace the existing arrangements in the main streets. The scheme is being submitted to the M.o.T.

Goole.—T.C. has approved electric lighting scheme for Victoria Street, Hook Road, and Swinefleet Road, at a cost of £2,479.

Warrington.—The R.D.C. engineer is to prepare a scheme of street lighting for Warrington Road, Fearnhead, and Warrington Road, Risley.

Company Activities . . .

Bagdad Light and Power Co.

The profit after all charges, including taxation, for 1951 is £116,776 (*£140,429*). The dividend is 7½% tax free (7%). To reserve to finance capital expenditure £75,000 (*£100,000*), and there is £15,723 (*£10,796*) carried forward.

Christy Bros.

It is proposed to increase the share capital up to £300,000 by the creation and issue of 50,000 Ordinary shares of £1 on terms yet to be decided. The new shares will rank for dividend and in all other respects *pari passu* with the 200,000 existing Ordinary shares. This additional capital is required to reduce the bank overdraft and to provide more working capital.

Cinema-Television Ltd.

Consolidated trading profit for the 53 weeks ended June 28 last is £511,886 (*£566,112 for previous year*). After deducting depreciation, amortisation, taxation, etc., the profit attributable to Cinema-Television is £176,726 (*£237,023*) plus profits on disposals of fixed assets £1,075 (*£858*).

Eveready South Africa

For the year ended June 30, the net profit is £75,238 (*£81,110*) after charging depreciation of £7,032 (*£11,841*) and taxation of £31,226 (*£30,800*). The sum of £10,000 is placed to reserves, and there is a dividend of 1s. 3d. per 5s. share (*1s. 6d.*), absorbing £60,926.

Philips Incandescent Lamp Works

This Dutch concern announces that in the first half of the year its world sales, Fls. 624 million, compared with Fls. 564 million for the corresponding period of 1951, an increase of 11%. It is not expected, however, that this rate of increase will be maintained for the whole year.

Radiovisor Parent Ltd.

For the year ended March 31 last, the profit after charging taxation, is £6,591 (*£10,089*). The final dividend is 12½%, making 25% for the year (*both same*). Trading continued to expand, it is stated, and the profit before taxation increased from £10,089 to £15,091. The accumulated tax losses, which in past years resulted in the company having no liability to tax, have now been absorbed.

Southern Brazil Electric Co.

From the operations during 1951 there is a profit of £55,814 (*£138,213*), less £6,399 (*£3,774*) set aside to statutory provision, and the deficit carried forward is reduced from £71,557 to £22,142. The directors state that the properties of the last of the operating subsidiaries have been sold to the municipality and the company thus becomes purely a holding company.

Sterling Cable Co.

Though the total turnover of the company has been handsomely increased, the proportion of export business has been maintained at 60%, Mr. J. S. Clark, chairman and managing director, states. Particular attention has been paid to the dollar market, and since last year a turnover exceeding $1 million has been attained in that market. As to the future, the company has a full and varied order book and, to date, an increased turnover. In the "bad old days" one could have prophesied another successful year's trading, but in these times, when the old-established principle of "willing buyer and willing seller" can be guillotined overnight by Government edict, a forecast is no longer possible, he added.

Thorn Electrical Industries

Permission has been obtained from the Capital Issues Committee for the issue of £500,000 loan stock for cash, Mr. Jules Thorn, chairman, announced at this meeting last week.

Vactric Ltd.

Reporting on the company's operations for the year to March 29 last, the directors state that since the start of the year under review the volume of business has progressively diminished because of the present world policy of restricting consumer expenditure. To meet the altered conditions the directors propose to cease production at the Newhouse factory in Scotland and to arrange for the company's products to be manufactured elsewhere, thus reducing the heavy on-costs presently being incurred and so avoiding losses, which the company, owing to its financial structure, is unable to face. This decision, the directors point out, has in no way been influenced by the Treasury. Funds derived from the realisation of assets thereby set free will, in the terms of the agreement, be applied in or towards repayment of the loan from the Treasury. For the year ended March 29 last, the consolidated trading surplus, after all interest payments, etc., is £178,288 (*£279,441*). To depreciation £50,576 (*£36,292*), taxation £54,651 (*£68,712*), loans repayment reserve £18,000 (*£48,000*), leaving a balance of £55,061 (*£126,437*). No Preference or Ordinary dividend is recommended.

Dividends Declared

Aberdare Cables (*Holdings*).—Interim of 10% (*same*).

Chloride Electrical Storage Co.—A. and B. interim of 5% (*same*), payable on October 1.

W. T. Henley's Telegraph Works Co.—Interim of 5% (*same*) but on larger capital.

Hoffmann Manufacturing Co.—Interim of 5% tax free.

Thomas Bolton and Sons.—Interim of 2½% (*same*).

Commercial Information

CONTRACTS OPEN

HOME

Sept. 27.—Barry T.C. Installation of street lighting to Group A standard along 3¼ miles of roads in the borough. Schemes are to be submitted for the complete works of dismantling existing lighting installations, supply and erection of columns and fittings and electrical connections to mains. Borough Engineer and Surveyor, Town Hall, Tynewydd Rd., Barry.

Sept. 27.—Lanark. Electrical work in erection of secondary school at East Kilbride. Applications by above date to Wm. C. Brownlie, County Clerk, Lanarkshire House, 91 Ingram St., Glasgow.

Sept. 27.—Wisbech (Ely) R.D.C. Wiring of 12 houses at Ring's End. T. A. C. March, housing surveyor, Council Offices, Alexandra Road.

Sept. 29.—Ayr. Supply and erection of 54 lighting units on trunk roads A.71 and A.76 comprising 40 concrete columns, 54 sets of 140 W sodium lamps and wiring for 40 units. Applications by above date to County Engineer, County Bldgs.

Sept. 29.—Hull. Electrical installation at Wivern primary school. City Architect's Dept., Guildhall. Deposit £1 1s.

Sept. 29.—West Riding. Renewal of electrical installation at Harrogate School of Art. County Architect, "Bishopgarth," Westfield Rd., Wakefield. Deposit £2 2s.

Sept. 30.—Birkenhead T.C. Supply and erection of 2-ton capacity electric hoist block and single girder manually operated gantry crane. Also supply, etc., of new duplicate electrically driven pumping plant at Flaybrick Waterworks. These are separate contracts. Water Engineer, 601 Borough Rd.

Sept. 30.—Buckhaven (Fife). Renewal of electrical installation at Randolph Wemyss Memorial Hospital for East Fife Hospitals Board of Management. Secretary of Board, 243a High St., Kirkcaldy.

Oct. 1.—Dalkeith T.C. Electrical work in 80 houses at Woodburn. Particulars from the Surveyors, Morham and Brotchie, 29 Hanover St., Edinburgh.

Oct. 1.—Manchester. Supplies of lanterns, time switches, concrete columns, cable, mantles and glass globes for street-lighting purposes, wanted for 1953. City Surveyor (Room 329), Town Hall.

Oct. 2.—Lisburn. Installation of electric lighting and power service, radio wiring and call-bell system at Lagan Valley Hospital. J. R. W. Mirland, Consulting Engineer, 13 Wellington Pl., Belfast. Deposit £2 2s.

Oct. 3.—Brockhall (Lancs). Hospital Committee requires supply of electric lamps for year beginning Nov. 1. Secretary is M. Lawrence, Brockhall Hospital, Langho, nr. Blackburn.

Oct. 3.—Manchester. Provision of sundry electrical engineering equipment in connection with extension to Municipal College of Technology. Details from Acting Principal, College of Technology. (See September 11 issue.)

Oct. 3.—Manchester. Supply of various X-ray equipment for fuel research laboratory in extension to College of Technology. Particulars from acting Principal of College, Manchester 1. (See Sept. 18 issue.)

Oct. 3.—Portsmouth T.C. Supply and installation of an electrically operated air conditioning and gas filtration plant at the civil defence main control, Fort Widley. City Engineer, Council Chambers, 1 Clarence Parade, Portsmouth. Deposit £2 2s.

Oct. 4.—Cannock U.D.C. Provision and erection of 47 sodium and 7 fluorescent street lighting columns in Class A for Church St. and Wolverhampton Rd. E. Lomax, Engineer and Surveyor, Council House. Deposit £2 2s.

Oct. 4.—Saddleworth U.D.C. Installation of 140 W sodium lighting on A670 road from Oldham to Standedge. G. H. Booth, Lighting Superintendent, Council Offices, Uppermill, nr. Oldham.

Oct. 6.—Hornchurch U.D.C. Installation of electrical heating, ventilating and other services in conversion of cinema in Station Lane to civic hall. Engineer and Surveyor, Council Offices. Deposit £2 2s.

Oct. 6.—Whitley Bay U.D.C. Supply and erection of 22 sodium street lighting units with concrete columns along Earsdon and Seatonville Roads. Surveyor is E. Roberts, Council Offices. Deposit £2 2s.

Oct. 8.—Goole T.C. Vertical spindle centrifugal pump, 75,000 gal/hr. against static head of 210 ft, with electric motor for Pollington Waterworks. Silcock and Simpson, Consulting Engineers, 10 Park Row, Leeds. Deposit £5.

Oct. 8.—Northern Ireland. Electrical installation in R.U.C. county station, Galgorm Rd., Ballymena. Documents from Ministry of Finance (Room 103), Law Courts Building, May St., Belfast.

Oct. 10.—Monmouthshire. Installation of electricity to house and farm buildings on Holding Panteg No. 4, Shwad Farm, Panteg. Documents from County Land Agent, Cambric House, Caerleon, Mon.

Oct. 14.—Cork. Electrical installation at the Southern Regional Sanatorium, Sarsfields Court, Glanmire, now under construction for the Department of Public Health, to house 344 patients. Work comprises 220/380 V installation for lighting, heating, cooking, sterilising, water heating, etc., and low voltage installation 12-100 V for nurses' call systems, telephones, radio and p.a. remote control, clocks, etc., and the supply and fixing of specified equipment, appliances and fittings. P. O. Cinneide, secretary, Department of Public Health, Custom House, Dublin. Deposit £20.

Oct. 14.—Grimsby T.C. Electrical installation at new secondary school for boys in Chelmsford Ave. J. V. Oldfield, Borough Engineer and Surveyor, Municipal Offices, Town Hall Square. Deposit £5.

Oct. 18.—Northern Ireland. Lighting and heating installations at 27 Adelaide St., Belfast,

for N.I. Tuberculosis Authority. D. W. Boyd, Scottish Provident Buildings, Wellington Place, Belfast. Deposit £5 5s. to Secretary of Authority at Adelaide St. address first.

Oct. 20.—Diss (Norfolk) U.D.C. Supply of five sets of electrically driven vertical unchokeable pumps, screens, etc., for drainage scheme. Engineers are John Taylor and Sons, Artillery House, Artillery Row, Victoria St., Westminster. Deposit £5.

Oct. 27.—West Riding. Renewal of electrical installation at Mexborough and Wath-on-Dearne grammar schools. County Architect, "Bishopgarth," Westfield Rd., Wakefield. Deposit £2 2s. in each case.

Oct 31.—Bristol. Supply of laboratory and workshop equipment for electrical power supply and experimental machine sets, electronics, etc., for College of Technology. G. H. Sylvester, Chief Education Officer, The Council House, College Green. (Advertised in this issue.)

No date stated.—Sedgley U.D.C. Provision and erection of 23 concrete columns with 250 W mercury lighting equipment and accessories for Bilston St. and George Rd. Documents from W. M. Jones, Engineer and Surveyor, The Limes, Dudley Rd., before Sept. 27.

OVERSEAS

*Details of items marked * may be obtained on application to the Board of Trade, Horseguards Avenue, S.W.1, quoting reference.*

Oct. 14.—Formosa. Central Trust of China at 96 Po Ai Rd., Taipei, Taiwan, requires supply of transformers, transmission lines and switchboard control gear. B.o.T. (Ref.: CRE 30389/52).*

Oct. 14.—South Africa. Supply of (*a*) 10 sterilisers for instruments about 8 by 5 by 4 ins., 220/38 V a.c. for Somerset Hospital, Cape Town; and (*b*) one mobile X-ray unit, 10-15 milli-amp complete for 220/250 V a.c., for Voortrekker Hospital, Calvinia. Controller of Stores, 34 Roeland St., Cape Town. B.o.T. (Ref.: CRE 31479/52).*

Oct. 15.—India. Supply of one portable electric arc welding plant, single operator d.c. motor driven having 400 A continuous welding capacity; and one of the same plant but diesel engine driven having 300 A capacity. Director General Supplies and Disposals, Shahjahan Rd., New Delhi. B.o.T. (Ref.: CRE 31646/52).*

Oct. 15.—South Africa. Municipality of Roodepoort-Maraisburg invites tenders for supply of eight h.t. ring main units; eight 200 kVA transformers; and 7,200 incandescent lamps. Documents from Electrical Engineer, Municipal Offices. Deposit £1.

Oct. 22.—India. Supply of 39 distribution transformers, comprising (provisionally) eight of 11 kV/400 V 100 kVA, 15 of 11 kV/400 V 250 kVA, 16 of 11·5·5 kV/400 V 250 kVA. Superintending Engineer (Technical) Electrical, 157 Mount Rd., Madras. B.o.T. (Ref.: CRE 31097/52).*

Oct. 27.—Formosa. Central Trust of China at 96 Po Ai Rd., Taipai, Taiwan, invites tenders for supply of transformers, h.t. porcelain insulators and magnetic switch to various specifications. B.o.T. (Ref.: CRE 31074/52).*

Oct. 31.—Formosa. Supply of induction motors to various specifications for 440/220 V 3-phase, 60c/s, continuous rating 1,200 r.p.m. Central Trust for China, 96 Po Ai Rd., Taipei, Taiwan. B.o.T. (Ref.: CRE 31210/52).*

Nov. 6.—Pakistan. Supply of electric cables and cable boxes, including sundry types of l.t. underground cables, bazaar cables, lead-covered cable, cable boxes and binding wires. Director General of Supply and Development, Gvt. of Pakistan, Frere Rd., Karachi. B.o.T. (Ref.: CRE 31454/52).*

Nov. 14.—N. Rhodesia. Supply and installation of 11 kV and l.v. cables, switchgear and transformers to various specifications. Documents from Consulting Engineer, P.O. Box 4648, Johannesburg, on payment of £3 3s.

No date stated.—Uruguay. Supply of up to 30,000 ft thickly covered iron electrodes for arc welding work on train rails. Machines to be used are d.c. 150-250 A, positive electrode. Administracion Municipal de Transportes Colectivos de Montevideo. B.o.T. (Ref. CRE 30814/52).*

CONTRACTS PLACED

Carrickfergus T.C. Electrical installation in 400 houses on Victoria Rd. estate, The Rotary Electric Co. Ltd., £8,716.

Cookstown (Tyrone) U.D.C. Wiring of 54 houses at Monrush, J. Henry, £1,162.

Lambeth. Electrical installations at Ashmole primary school, E. Satterthwaite Ltd.

Sheffield. Electrical work at Stradbroke school, £5,775, and Greenhill secondary school, £7,673, Yorkshire Electricity Board; same at Brook secondary school, T. W. Sampson and Co., Ltd., £11,238; same in 414 dwellings on Hackenthorpe estate, M. J. Gleeson (contractors) Ltd., £5,645; and same in

Your Queries — Answered

"Renat" lighting fittings, makers of? T.E.—New Endeavour Eng. Ltd., 4 Avenue Rd., N.W.10. (23974)

"Magnum" vibro-massage equipment, suppliers of? R.G.—Electric Supplies and Repairs Ltd., 28 New Cannon St., Manchester 1. (23981)

Prismatic ring for lamps, makers of? L.E.—Jenolite Ltd., 43 Piazza Chambers, Covent Gdn., W.C.2. (23987)

"Mardrive" clutch motors, makers of? G.F.—Marine Eng. Co. (Stockport) Ltd., Bulkeley St., Edgeley, Stockport. (23992)

"Ultralux" lighting fittings, makers of? S.E.—Troughton and Young Ltd., Imperial Court, Basil St., S.W.3. (23999)

"Climax" windmill generators, makers of? E.C.—Thomas and Son (Worcester) Ltd., Droitwich Rd., Worcester. (24006)

"New Era" blankets, makers of? S.D.—Thermoset Appliances Ltd., Chapel Works, Failsworth, Manchester. (24015)

The above are selected from questions we have answered this week. If you have a query, send it to us.

Herries Rd. bus garage, Hall and Stinson, Ltd., £1,198.

South Shields. Rewiring of Stanhope Rd. county school, £1,407, and electrical work in section of Technical College, £625, C. Ramsay and Son; rewiring of Gilbert St. infants' school, Bonham Electrical Co., Ltd., £707.

TRADE NOTES

New Phone No. The telephone number of the Brighton office of Drake and Gorham (Contractors) Ltd. has been changed to 21894.

New Branch. Falk Stadelmann and Co., Ltd., are opening a new branch at 10 Commercial Road, Southampton, on October 1. The telephone number will be Southampton 76781.

Zinc Price. As from September 22, the price of good ordinary brand zinc was reduced by £4 to £122 a ton, delivered.

Beama Contract Price Adjustment formulae. *For Electrical Machinery and Equipment.* For purposes of calculating variations in: (*a*) "Rates of Pay"—the rate of pay for adult male labour at September 13, 1952, shall be deemed to be 134s. (*b*) "Cost of Material"—the index figure for Materials used in the Electrical Machinery Industry published in the Board of Trade Journal on September 13, 1952, is 169·3.

For Turbo-Generating and Allied Plant. For purposes of calculating variations in: (*a*) "Rates of Pay"—the rate of pay for adult male labour at September 13, 1952, shall be deemed to be 134s. (*b*) "Cost of Material"—the index figures published in the Board of Trade Journal on September 13, 1952, are: Materials used in Mechanical Engineering Industries—151·9. "Blast Furnaces and Iron and Steel Melting and Rolling (40 and 41)"—142·6. The price of brass condenser tubes ¾ in. o/d, 18 SWG published in The Metal Bulletin on September 12, 1952, is 3s. 11½d.

For Outstanding Contracts covered by the B.o.T. Intermediate Products Index. For purposes of calculating variations in: (*a*) "Rates of Pay"—the rate of pay for adult male labour at September 13, 1952, shall be deemed to be 134s. (*b*) "Cost of Material"—the index figure for Intermediate Products published in the Board of Trade Journal on September 13, 1952, is 363·0.

PRICES OF CABLE METALS AND OTHER MATERIALS
(at Tuesday night)

	£ s. d.	New York price
COPPER, electrolytic	285 0 0	—
LEAD, good soft pig (foreign)	131 0 0	£128 0 0
,, ,, ,, "English" quality ...	132 10 0	
TIN (99·99.76%) ... ...(Cash)	957½-958	—
,, (3 months)	946½-947	—
ALUMINIUM, commercial purity (del.)	157 0 0	—
ZINC	122 0 0	112 0 0
ARMOURING:		
Galv. Steel Wire (0.104 in.) ...	54 0 0	—
Mild Steel Tape (0.04 in.)	39 15 0	—

GAZETTE ANNOUNCEMENTS

COMPANIES ACTS

Bingley Refrigeration Services Ltd. Creditors are required to send particulars to liquidator, C. A. Harrison, F.C.A., Cheapside Chambers, 23 Cheapside, Bradford, by Nov. 18.

Great Asby Electric Light and Water Co., Ltd. Resolution for voluntary winding-up passed at meeting on Sept. 12, when A. D. Compston, Cheetwood Rd., Manchester, was appointed liquidator.

Planet Refrigeration Ltd. Resolution passed at meeting on Sept. 3 for winding-up. Alan Scott, C.A., 198 Marton Rd., Middlesbrough, has been appointed liquidator and creditors are asked to send particulars to him by Oct. 31.

Princess Silk Shade Co. Ltd. Resolution for voluntary winding-up passed at meeting on Sept. 9. Leslie H. Shipton, 31 Lloyd St., Manchester, has been appointed liquidator, to whom creditors are asked to send particulars by Oct. 31.

Voluntary Liquidation

Berkeley Russell Ltd., electrical engineers, of Cleethorpes. At meeting of creditors statement of affairs submitted showed liabilities of £4,134. Assets estimated to produce £2,946, and after allowing £101 for preferential claims, there were net assets of £2,844, or deficiency of £1,290. Issued share capital was £1,000 and so far as the contributories were concerned, there was total deficiency of £2,290. Resolution passed for appointment of R. B. Smith, 3 Alfred St., Boar Lane, Leeds, and R. S. Howard, 84 Cleethorpes Rd., Grimsby, as joint liquidators, with committee of inspection.

Private Arrangement

J. Truin, trading as H. C. Taylor and Co., 54 Mosley St., Manchester, electrical engineers. The creditors of the above were called together recently when an approximate statement of affairs was submitted showing liabilities of £16,090. The assets were estimated to realise £7,177, and after allowing £60 for preferential claims, there were net assets or £7,117, or a deficiency of £8,973. After discussing the position, creditors decided that the debtor should be called upon to execute a deed of assignment in favour of Mr. R. F. Bendall, C.A., of Messrs. Poppleton and Appleby, 31 Lloyd St., Manchester, as trustee of the estate. A committee of inspection was also appointed.

BANKRUPTCY ACTS

Public Examination

York. William P. Wann, trading as Electricity Service in Grape Lane, York. Public examination will be at the Law Courts, Clifford St., on Oct. 23 at 10.30 a.m. First meeting took place yesterday (Wed.).

Release of Trustee

Ipswich. Jack Cooper, mechanical and electrical engineer, trading at Market Place, Orford. Trustee was Kenneth E. Fisk, Official Receiver, 13a Gt. Colman St., Ipswich.

TRADE MARKS

This information is extracted from the Official Journal by permission of the Controller.

Aeromaster. 708,000. Class 11. Ventilating fans. Horden-Richmond Ltd., Hydulignum Works, Haddenham, Bucks.

Deccette. 709,070. Class 9. Television sets and sound reproducing instruments and apparatus. Decca Record Co. Ltd., 1-3 Brixton Rd., S.W.9.

Duolacent. 709,554. Class 11. Lamp fittings and lamp glasses. Heyes & Co. Ltd., Water-Heyes Electrical Works, Water-Heyes Rd. Wigan, Lancs.

BUSINESS PROSPECTS

HOME

Aberdeen. It has been decided to invite tenders for wiring of 82 (of proposed 116) houses at Rhynie, Gartly and Lumsden.

Airdrie T.C. Approval granted for erection of 100 houses for Scottish Special Housing Association.

Andover R.D.C. Erection of 22 houses, two groups of 20 houses, and 14 houses, and 4 bungalows under 4 contracts, at Wendover. Architect, R. C. White, 4 Temple Sq., Aylesbury.

Armagh. Loan sanction of £25,000 has been granted to C.C. for erection of welfare centres at Armagh and Bessbrook.

Aylesbury T.C. Dulrae Ltd. have submitted for approval plans for extensions to their factory in Griffin Lane. Also, Council is applying to borrow £5,000 to purchase gas and electric cookers.

Belfast. Erection of 47 houses and 12 flats in Disraeli St. Housing Architect's Dept., 94 Chichester St.

Bo'ness T.C. Erection of 54 houses at Maidenpark third development scheme has been approved.

Bosworth R.D.C. Plans in hand by Council's Architect for erection of 62 houses on Manor Lane site at estimated cost of £81,334.

Castleford U.D.C. Erection of 204 dwellings in four groups on Ferry Fryston estate. Architects, Needham, Thorp and White, 6 High Petergate, York.

Congleton (Cheshire). Plans approved for bakery and shoe factory in Brunswick St. for local Co-operative Society.

Corby (Northants). John White, Ltd., Higham Ferrers, are seeking site at New Town for erection of a factory.

Crewe T.C. Approval received for construction of 253 houses next year and 300 in 1954.

Cumberland. Construction of primary school at Westfield. John H. Haugham is County Architect.

Dewsbury T.C. All trades in additions to Moor school. Borough Architect and Building Surveyor, Town Hall.

Downpatrick U.D.C. Approval granted for erection of 40 houses in Folly Lane.

Enfield U.D.C. Erection of 78 flats and 60 houses on Hoe Lane site. Frank Lee, Engineer and Surveyor, 7 Little Park Gdns.

Falkirk T.C. Erection of 200 houses in Easter Carmuirs scheme, Camelon, and 15 in Main St., Bainsford, approved. Council also approved building of 100 houses on Bog Rd. site and further 260 in Easter Carmuirs scheme for Scottish Special Housing Association.

Forehoe and Henstead (Norfolk) R.D.C. It is proposed to build 100 houses on nine sites. Largest group (42) is at Costessey.

Grangemouth T.C. Dean of Guild Court has approved plans for erection of 10 shops at Beancross, estimated to cost £38,000.

Halesowen T.C. Erection of 68 houses on Hasbury Farm estate extension. Architects, A. T. Butler and Partners, 31 Priory St., Dudley.

Hemsworth R.D.C. Construction of 50 houses at Ryhill. S. Price, Engineer and Surveyor to Council, Brierley Hall, Brierley, near Barnsley.

Kendal T.C. Erection of 36 houses on Hall Garth estate. J. Barnfather, Borough Engineer and Surveyor, Municipal Offices, Lowther Street.

Kingsclere and Whitchurch (Hants) R.D.C. Permission received to build 95 houses in Micheldever Rd.

Lanchester (Dur.) R.D.C. Construction of 66 houses at Hamsteels. Council's Engineer, Council Offices.

Larne T.C. Loan of £391,000 has been granted for construction of 244 houses on Old Glenarm Rd. site.

Leeds. Improvements to Town Hall, costing £12,000, being considered.

Liverpool. Arrangements completed for rewiring of St. John's Market at cost of about £6,000.

Maidstone R.D.C. Erection of 28 houses at Coxheath, 24 at Yalding, and 20 at Marden. Engineer and Surveyor, 26 Tonbridge Rd.

Manchester. Construction of 44 houses on a number of sites. Director of Housing, Town Hall.

Newport (Mon). L. H. Fearis Ltd. are seeking approval for extensions to their Vivian Rd. premises.

North Riding. S. W. Milburn and Partners, 9 Esplanade, Sunderland, have been appointed architects for new junior school at Eastfield, and J. H. Napper, 56 Eldon Place, Newcastle, for primary school at Marske.

Northwich (Cheshire). I.C.I. Ltd. is planning to convert Vale Royal Abbey into offices.

Nottingham. Construction of second phase of junior school at Greencroft, Clifton. R. M. Finch, City Engineer and Surveyor, The Guildhall.

Oswestry R.D.C. Scheme for electrical installation on Morda and Llanymynech sites is being prepared and tenders will be invited.

Paddington. Erection of seven blocks, comprising 386 flats, on Hallfield estate. W. H. Bentley, Town Clerk, Town Hall, W.2.

Sandbach U.D.C. Construction of 46 houses on site No. 5. H. J. Rees, Engineer and Surveyor, Council Offices, Crewe Rd.

Shropshire. A £300,000 comprehensive school is to be established at Market Drayton.

South Shields. Erection of four shops and flats in Lake Ave. and 68 houses in Simonside estate. Borough Engineer is J. Reid.

Stockport T.C. Erection of 58 dwellings on Nelstrop Rd. estate. Wm. F. Gardner, Borough Surveyor, Town Hall.

Tipton T.C. Erection of 64 flats on Park Lane West estate. Housing Architect, Municipal Bldgs.

Walsall. Plans approved for second instalment of Technical College, estimated to cost over £100,000. Work expected to start next April.

York.—Erection of 72 flats on Askham Lane estate, and 4 bungalows and 2 houses in Danebury Court, City Architect, Guildhall.

OVERSEAS

Iraq. Price quotations required for equipment for welding shop, electricity shop, refrigeration and air - conditioning shop, machine shop and others in connection with proposed establishment of technical college at Mosul. Literature should be sent to Mr. Paul McCleester, c/o U.S. Embassy, Baghdad.

MEETINGS TO NOTE

THURSDAY, SEPT. 25

I.E.S. (Nottingham Centre). Annual luncheon and induction of chairman. Victoria Hotel.

INST. OF WELDING (N. London Branch). "Welding in America." F. Clark, H. E. Lardge, and S. M. Reisser. Regent St. Polytechnic.

FRIDAY, SEPT. 26

I.E.S. (Leeds Centre). Annual dinner and induction of chairman. Visit of President. Guildford Hotel, The Headrow.

INCORP. PLANT ENGRS. (Birmingham Branch). "Modern Factory Lighting." F. Jamieson. Imperial Hotel, 7.30 p.m.

MONDAY, SEPT. 29

I.E.S. (Leicester Branch). "Horticultural Lighting." J. J. French. E. Midlands Elect. Board, Charles St., 6.30 p.m.

E.P.E.A. (London).—"Steam Pipe Systems." Wing. Cdr. J. M. Aiton. Caxton Hall, S.W.1, 7 p.m.

A.S.E. (Bournemouth Branch).—"General Tariff Problems." H. E. White. Grand Hotel, Firvale Rd., 8.15 p.m.

TUESDAY, SEPT. 30

I.E.S. (Cardiff Centre). Chairman's address by A. J. Dalton. S. Wales Electricity Board, 5.45 p.m.

WEDNESDAY, OCT. 1

I.E.S. (Edinburgh Centre).—"Lighting for Inspection." H. E. Bellchambers. City Lighting and Cleansing Dept., 357 High St., 7 p.m.

I.E.S. (Newcastle Centre).—Chairman's address by G. Kingsley-Lark. Minor Durrant Hall, Oxford St., 6.15 p.m.

INCORP. PLANT ENGRS. (Southampton Branch). — "Materials Handling and National Recovery." J. R. Sharp of Lancing Bagnall, Ltd. Polygon Hotel, 7.30 p.m.

I.E.S. (Swansea Group).—Chairman's address by G. J. Higgs. Minor Hall, Y.M.C.A., 6 p.m.

I.E.E. (Tees-side sub-centre).—Chairman's address by J. R. Sutcliffe. Cleveland Scientific and Technical Inst., Middlesbrough, 6.30 p.m.

I.E.E. (Southern Centre).—Chairman's address by C. J. Turnbull. B.E.A., 111 High St., Portsmouth, 6.30 p.m.

INSTN. OF HEATING AND VENT. ENGRS. (London). — "Industrial Radiant Heating." F. R. L. White. Instn. of Mechanical Engrs., Storey's Gate, S.W.1, 6 p.m.

A.S.E.E. (N. London Branch). "Public Address Systems." Repr. of Automatic Tel. and Electric Co., Ltd. Three Jolly Butchers Hotel, Wood Green, 8.15 p.m.

THURSDAY, OCT. 2

I.E.S. (Glasgow Centre).—"Lighting for Inspection." H. E. Bellchambers. 39 Elmbank Crescent, 6.30 p.m.

I.E.S. (Nottingham Centre).—Chairman's address by P. L. Ross. E. Midlands Board, Smithy Row, 6 p.m.

I.E.S. (Bradford Group).—"Textile Lighting." A. G. Smith. Yorks Board, Sunbridge Rd., 7.30 p.m.

I.E.S. (Exeter Group).—"Lighting for Prevention of Industrial Accidents." E. W. Murray. Providence Hall, Northernhay St., 7 p.m.

BRITISH INSTN. OF RADIO ENGRS. (Scottish Section). "Recent Developments in TV." H. McGhee. Edinburgh University, 7 p.m.

PURCHASING OFFICERS' ASSOC. —National Conference and Minibition at Harrogate until Oct. 5.

INST. OF WELDING (Tees-side Branch). — Argonarc film and lecture.

PURCHASING OFFICERS' ASSOC. 21st Anniversary Conference opens today at Harrogate and closes on Oct. 5.

A.S.E.E. (S. London Branch).—"A Concrete Proposition." Cafe Royal, Croydon, 8 p.m.

FRIDAY, OCT. 3

A.S.E.E. (Liverpool Branch).—"Television." B. P. Atkinson. Liverpool Engrng. Soc., 9 The Temple, Dale St., 7.30 p.m.

I.E.S. (Bath and Bristol Centre).—"Lighting for the Prevention of Industrial Accidents." E. W. Murray. S. Western Board, Old Bridge, Bath, 7 p.m.

I.E.S. (Birmingham Centre).—Chairman's address by E. H. Norgrove. "Regent House," St. Philip's Place, Colmore Row, 6 p.m.

I.E.S. (Huddersfield Group).—"Some Aspects of Department Store Lighting." A. W. Jervis. Electricity Showrooms, Market St., 7.15 p.m.

E.I.B.A. (Birmingham Branch).—Annual Carnival Dance at Magnet Club, Witton Works of G.E.C.

ELECT. TRADES' COMMERCIAL TRAVELLERS' ASSOC.—Ladies' Night at Cafe Royal, Regent St., London, 6.45 p.m.

I.E.E. (N. Staffs sub-centre).—Chairman's address by J. H. Pirie. Elect. Showrooms, Stoke, 7 p.m.

INSTN. OF HEATING AND VENT. ENGRS. (Manchester Branch).—Silver Jubilee annual dinner at Midland Hotel, 7 p.m.

EXHIBITION DIARY

International Machine Tool Exbn. Opened at Olympia on **Sept. 17** and closes **Oct. 4.**

N. West Business Efficiency Exbn. Open at St. George's Hall, Liverpool, until **Sept. 27.**

Internat. Comm. Motor Transport Exbn. 16th show opens Earls Court, London, **Sept. 26, closes Oct. 4.**

1952 Minibition. Org. by Purchasing Officers' Assoc. to run concurrently with their Nat. Conf. at Harrogate between **Oct. 2** and **5.**

NEW COMPANIES

Extracted from the Register issued by Jordan and Sons, Ltd., 116 Chancery Lane, London W.C.2.

Cowap and Son Ltd., 58 Mumps, Oldham. Electrical engineers, etc. Nom. cap.: £3,000. Dirs.: C. S. Cowap, J. A. Cowap and T. Curry.

Freeze Rentals Ltd., 27 Castle Drive, Ilford, Essex. Refrigeration and cold-storage engineers, manufacturers and letters on hire of and dealers in machinery, etc., connected with refrigeration and cold storage. Cap.: £100. Dirs.: W. J. H. James, J. A. Kirk and F. A. James.

Guylew Manufacturing Co. Ltd., Brush Quay, Gorleston-on-Sea, Suffolk. To take over business of general engineers carried on at Gorleston-on-Sea, as Guylew Manufacturing Co., mechanical, automobile, electrical, precision and general engineers, gas and water engineers and fitters, etc. Cap.: £1,000. Dirs.: L. G. J. G. Dosogne and Mrs. D. G. Dosogne.

Kin-Electric (Contractors) Ltd., 5 Belmont Av., Bulwell, Nottingham. Manufacturers of and dealers in radios, television sets, etc. Cap.: £1,000. Dirs.: J. S. Thorpe and Mrs. E. Thorpe.

Mole - Richardson (Espana) Ltd., 25-29 Chase Rd., N.W.10. To carry on, in Spain or elsewhere, business of manufacturers of and dealers in photographic materials, electric and other motors, dynamos, cinematograph apparatus, and television and wireless transmitters and receivers, etc. Cap.: £5,000. Dirs.: Sir A. W. Jarratt, A. H. Page and L. J. Hewins.

Norwood Electrical Co. Ltd., 373 Norwood Rd., Tulse Hill, S.E.27. Cap.: £100. Dirs.: S. G. Agombar, A. Agombar and R. R. Agombar.

Oxley Developments (Deal) Ltd. Radio and wireless research engineers and inventors, etc. Cap.: £1,000. Dirs.: R. F. Oxley, Market Place, Ulverston, N. Lancs; R. W. N. Oxley, 172 Downs Rd., Walmer, Kent, and A. C. Bright.

New Companies—continued

Prematic Heat Control Co. Ltd., Fairfax Works, Fairfax Rd., Harringay, N.8. Contractors, manufacturers of and dealers in jigs, fixtures and components used in the refrigeration, heating, ventilating and other engineering industries, etc. Cap.: £1,000. Dirs.: C. A. Bryant and J. W. L. Berkett.

T. Raymond Hodson Ltd., Guild Bldgs, Cattle Market, Brook St., Preston. To take over business of electrical contractor and dealer now carried on at Blackleach Lane, Catforth, nr. Preston, as "T. Raymond Hodson." Nom. cap: £3,000. Permt. dirs.: T. R. Hodson and Elsie Hodson.

Servomex Controls Ltd., Crowborough Hill, Jarvis Brook, Sussex. Electricians, mechanical engineers, etc. Nom. cap.: £10,000. Dirs.: R. C. Steel and J. R. Crockett.

Socold Refrigeration Ltd., 96 Cheetham Hill Rd., Manchester. Cap.: £1,000. Dirs.: C. Gardiner and W. Douglas.

PYE LIMITED

Television no longer a luxury

THE 23rd annual general meeting of Pye Limited was held on September 17 in London.

Mr. C. O. Stanley, C.B.E. (the chairman), in the course of his speech said: "Our turnover expanded considerably during the year and although our profits were increased from £541,000 to £611,000, the amount left after taxation was less by £21,000.

"Immediately following the close of our financial year we suffered a recession in the home market, and this has been publicised in the Press. I am glad to tell you that we are more than satisfied that we have made adequate provision for any obsolete or non-current stock which we held on the 31st March, 1952. The recession that was so clearly existing in the domestic market after the close of the accounts has, I am glad to say, lifted to some degree.

"In the export market I sometimes wonder if the Government realises the very determined attack which Western Germany and other European countries are making on the export radio markets. There is possibly no other market that is attracting as much attention from German salesmen at this moment as the British radio export trade. In one country where we have a substantial trading position there are 110 importers—2 of these are American, 2 British, 1 Swedish and the balance German. As well as this, it appears to be completely forgotten that we can only maintain our export trade in radio and television if we have a stable market at home.

PURCHASE TAX AND WAGES

The incidence of the restriction of hire purchase and the continuance of the 66⅔% purchase tax are not only crippling the market, but creating the worst possible state of instability. The United States, Canada and Australia learned by experience that extreme hire purchase restriction was fatal and consequently changed their policy, but we in this country have failed to profit by their example.

"Television is no longer a luxury; it has become essential and is one of the highest priorities in popularity for the working man. This country is trying desperately to keep wages down in order that we can maintain our export markets, and, as television is essential, would it not be better to sell sets at a more reasonable price without the crippling burden of purchase tax?

"We have, either in partnership with others or on our own responsibility, established important companies during the last few years in Australia, New Zealand, Ireland and Canada. It costs a lot of money to go into a new country, start from scratch and build a business. We feel that this is one of the ways in which England can earn money to pay for its food imports but we have been limited in our efforts by the resources we have had available. We have been told so many times by our politicians that the development of industry in Commonwealth countries must be left to other nationalities. However much we have felt that this was completely wrong, we had to accept.

"Your directors have now decided to apply to the Capital Issues Committee for permission to raise approximately £300,000 in the form of a rights issue of Deferred Ordinary shares to our existing Deferred Ordinary shareholders."

The report was unanimously adopted.

THORN ELECTRICAL INDUSTRIES

Record Production and Sales

THE sixteenth annual ordinary general meeting of Thorn Electrical Industries Ltd. was held on September 17 in London.

Mr. Jules Thorn (chairman and managing director), in the course of his speech, said: "The net profit amounts to £500,004 as compared with £379,961. Taxation requires no less than £303,185. Out of the total profit of half a million pounds, less than one-tenth is paid in dividends to shareholders, more than three-fifths is taken by taxation and the balance, about £150,000, is retained to augment the financial resources of the group.

"We have made application to the Capital Issues Committee for permission to issue £500,000 of loan stock for cash and have now received consent from Her Majesty's Treasury.

"The increased trading profit is the result of record production and sales, but unfortunately taxation has a crippling effect on any expanding organisation.

"The lighting division has continued to make good progress and our achievements, particularly in the fluorescent field, have been outstanding.

"The Ferguson radio and television division has enjoyed another record year. Our ability to offer outstanding value and reliability has further enhanced our reputation and attracted more business than ever before.

"Spectacular though our achievements were in television, they were matched by achievements in the field of sound reproduction.

"Exports of the company in the past year have advanced satisfactorily and progress has been substantial. Your company has been successful in securing a contract from the United States Government for aircraft communication equipment to the value of two and a half million dollars." The report was adopted.

TWO FIRST CLASS JOBS AT YARMOUTH

(above and right) views of the rebuilt Matthes New Restaurant and *(below)* Kerridge's new store, both in King Street, and wired throughout with HENLEY CABLES.

Electrical Contractors:
BOWERS & BARR LTD.
GREAT YARMOUTH

Architect:
A. D. COOKE, A.R.I.B.A.

MAKE EVERY JOB A FIRST CLASS JOB

Let HENLEY CABLES carry the Current

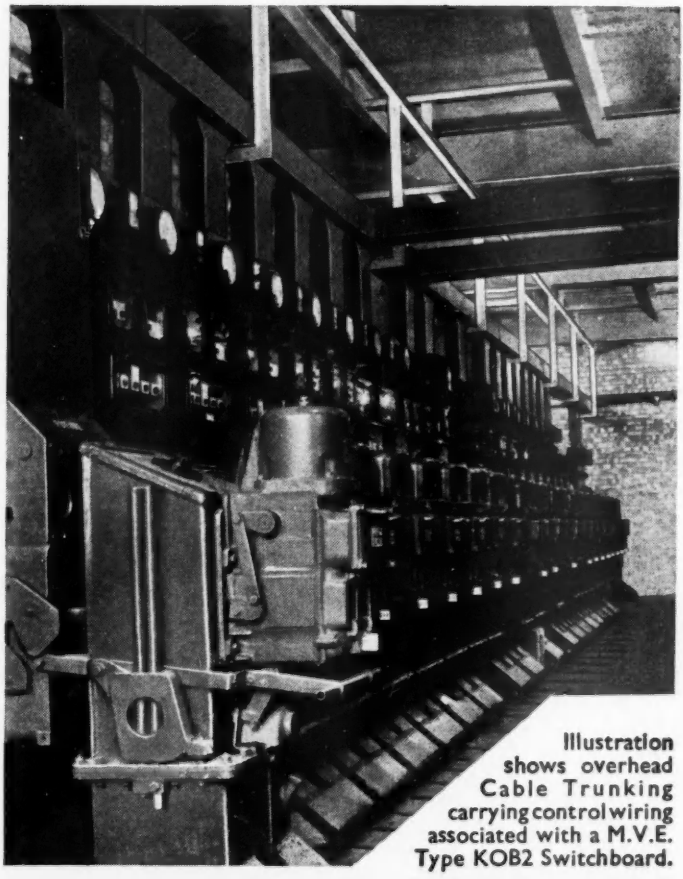
BY APPOINTMENT ELECTRIC CABLE MANUFACTURERS

W. T. HENLEY'S TELEGRAPH WORKS CO. LTD., 51-53 HATTON GARDEN, LONDON, E.C.1

CABLE TRUNKING

INSTALLED IN THE SUBSTATION OF A MODERN OIL REFINERY

IN INDUSTRY



Photograph by courtesy of Metropolitan-Vickers Electrical Co. Ltd.

Illustration shows overhead Cable Trunking carrying control wiring associated with a M.V.E. Type KOB2 Switchboard.

London Office: Wellington House, 125/130 Strand, W.C.2
Telephone Temple Bar 1743

The Power Centre Co. Ltd.

Lloyd Street, Wednesbury,
Phone: Wednesbury 0507 Staffs. Grams: "Powcent" Wednesbury

CLASSIFIED ADVERTISEMENTS

OFFICIAL TENDERS AND APPOINTMENTS

WANTED · FOR SALE WORK WANTED

Those wishing to advertise in these pages should send the text to the Classified Advertisement Dept., Electrical Times, Sardinia House, Sardinia Street, London W.C.2, before 10 a.m. on TUESDAY of week of issue. Official Displayed Advertisements are charged at 42s. per inch, and all other classified advertisements at 3s. per line. Situations Wanted will be published four times for twice the single insertion rate. Fee for Box No. and postage on replies is 2s.

TENDERS INVITED

CITY AND COUNTY OF BRISTOL EDUCATION COMMITTEE

College of Technology

ENGINEERING DEPARTMENT

IN 1953 the Department of Engineering will be provided with new premises including laboratories and workshops.

Tenders are invited for the supply of items of experimental and technical equipment and machinery, schedules of which are now available. These comprise laboratory and workshop equipment for electrical power supply and experimental machine sets, electronics, heat engines, hydro-dynamics, aero-dynamics, materials testing, metrology, heat treatment, machine tools, engineering science and drawing offices.

Last date for receipt of tenders will be October 31, 1952.

Firms wishing to tender are asked to write for further details direct to the undersigned.

G. H. SYLVESTER,
Chief Education Officer.

The Council House,
College Green,
Bristol 1. (B 168)

APPOINTMENTS VACANT

Engagement of persons must be made through a Local Labour Office or Scheduled Employment Agency, if the applicant is a man aged 18-64, or a woman aged 18-59; unless the person concerned is excepted or the employment is in a managerial or professional capacity, or is otherwise excepted from the provisions of the Notification of Vacancies Order, 1952.

SOUTH EASTERN ELECTRICITY BOARD

FIRST ASSISTANT DISTRICT COMMERCIAL ENGINEER
Medway District

SALARY £713 to £747 p.a. under N.J.B. Schedule, Class "F," Grade 6. Superannuable. Appropriate technical qualifications an advantage. Applicants must be experienced in supervision and organisation of all installation and showroom work, the preparation of estimates for domestic, commercial and industrial installations, and have a sound knowledge of tariffs and be capable of developing agricultural load.

Applications, giving two referees, must reach R. Mellor, M.I.E.E., A.I.Mech.E., Medway District Manager, Gardiner Street, Gillingham, Kent, by October 6, 1952.

A. L. BURNELL,
Secretary.

September, 1952. (B 183)

BRITISH ELECTRICITY AUTHORITY

North Western Division

DRAUGHTSMEN (Mechanical) and DRAUGHTSMEN (Electrical) required at Generation Construction Drawing Office, Agecroft, near Manchester. Applicants should have had experience of (a) the layout of generating stations or general mechanical engineering, or (b) cable layouts and electrical diagrams. Salary, depending on qualifications and experience, in range £413 to £547 or £547 to £651 (N.J.B. Sch. "D," Grade 6 or 5).

Apply to Establishments Officer, British Electricity House, 825 Wilmslow Road, Manchester 20, before October 4. Quote vacancy No. 793/4. (B 154)

BRITISH ELECTRICITY AUTHORITY

South Wales Division

APPLICATIONS are invited for the following superannuable appointments at salaries in accordance with the National Joint Board Agreement.

1. THIRD ASSISTANT ENGINEER (Metering), Technical Department, Divisional Headquarters. AX/CX.5 (£629—£810 per annum).

2. ASSISTANT ENGINEER (Combustion and Efficiency) at Cardiff Power Station, Class "F", Grade 7 (£677—£686 per annum).

Applicants for both these appointments should have the H.N.C. or equivalent. For appointment (1) the duties will include the standardisation of precision indicating instruments, testing and commissioning of large power metering units and associated equipment, together with the compiling of technical reports and records. For (2) previous experience in a modern power station is essential, together with experience of automatic combustion control equipment.

Forms of application, obtainable from the Divisional Secretary at the address below should be returned by October, 8, 1952.

H. J. BENNETT,
Divisional Controller.

British Electricity Authority,
Cardiff (Pengam Moors) Airport,
Cardiff.
September 17, 1952. (B 171)

BRITISH ELECTRICITY AUTHORITY

South West Scotland Division

APPLICATIONS are invited for the position of ASSISTANT SHIFT CHARGE ENGINEER at Dalmarnock Generating Station. Salary will be within the range £699 to £728 per annum, this being in Class "J," Grade 9, of the National Joint Board Agreement.

Applications on Form AE6, which may be obtained from the Authority's Headquarters or from any Divisional Office of the Authority, should be forwarded to the Divisional Secretary, 168 Broomhill Drive, Glasgow W.1, before October 13, 1952. (B 182)

MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

SECOND ASSISTANT ENGINEER (PLANNING) required in the Board's No. 4/5 Sub-Area, Electricity House, Rhostyllen, near Wrexham. Salary, £792 to £828 per annum (N.J.B. J/7).

Applicants should have the technical qualifications necessary to enable them to become chartered electrical engineers, and have experience of the design, construction and operation of distribution systems and knowledge of the technical and economic factors in system layout and design.

The appointment is superannuable and subject to medical examination.

Application forms obtainable from the Manager, above address. Quote reference 58A. Closing date, October 6, 1952. (B 162)

BRITISH ELECTRICITY AUTHORITY

Merseyside and North Wales Division

GENERAL ASSISTANT ENGINEER required at Machynlleth. Salary £481 to £619 N.J.B. (AX.8).

Applicants should have experience in the administration and operation of diesel and hydro-electric power stations. Higher National Certificate in electrical engineering or equivalent qualification will be an advantage. The appointment is superannuable and subject to medical examination.

Forms of application may be obtained from the Divisional Secretary, Beaconsfield Road, Woolton, Liverpool. Closing date October 2, 1952. (B 153)

SOUTHERN ELECTRICITY BOARD

JUNIOR ENGINEER

NO. 2 (Newbury) Sub-Area, Engineering Department. Salary N.J.B., Class "K," Grade 19 (£375-£387 per annum) to Grade 15 (£505-£524 per annum) according to experience and qualifications in accordance with Clause 35 of the agreement.

Duties will principally include assisting in the site testing of large industrial metering equipments and the maintenance and testing of protection relays.

Applicants must have had approved technical training and experience of similar work.

Applications on forms obtainable from the Sub-Area Secretary, 7 Oxford Road, Newbury, and returned to him in envelopes endorsed "Junior Engineer, Meter Test Department," not later than October 6, 1952.

JUNIOR ENGINEERS

No. 2 (Newbury) Sub-Area. Salary N.J.B., in accordance with the following:—

District	Class	Minimum Grade	Maximum Grade
Newbury	"E"	15 (£375)	14 (£413-£426)
Oxford	"G"	16 (£375)	14 (£453-£471)
Reading	"G"	16 (£375)	14 (£453-£471)
Swindon	"E"	15 (£375)	14 (£413-£426)
Sub-Area	"K"	19 (£375)	15 (£506-£524)

N.J.B. conditions of service.

Applicants should, preferably, have experience in the design, construction, operation and maintenance of h.v. and l.v. overhead and underground distribution systems, substation plant and distribution equipment, and possess suitable technical qualifications.

Applications on forms obtainable from the Sub-Area Secretary, and returned to him at 7 Oxford Road, Newbury, not later than October 6, 1952.

Successful candidates for the above appointments will be required to contribute to the B.E.A. and Area Boards' superannuation scheme, if eligible.

F. W. KEMPTON,
Secretary.

September 25, 1952. (B 176)

MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

APPLICATIONS are invited for the following appointments:—

(1) ENGINEERING DRAUGHTSMAN at the No. 2 Sub-Area Headquarters, Electricity House, Sandiway, near Northwich, Cheshire. Salary £413 to £547 per annum (N.J.B. Grade 6). Applicants should have had experience of substation construction, h.v. and l.v. plan layout and the preparation of switchgear wiring diagrams. Possession of Higher National Certificate in electrical engineering advantageous.

(2) ASSISTANT SECTION ENGINEER in the Warrington District of No. 2 Sub-Area. Salary £587 to £609 per annum (N.J.B. F/9). Applicants should preferably have the technical qualifications to enable them to become chartered electrical engineers and have had experience in h.v. and m.v. overhead and underground distribution work. The successful applicant will be required to undertake standby duties.

Application forms for the above posts obtainable from the Manager, Ref. 55, No. 2 Sub-Area Headquarters.

(3) SENIOR DRAUGHTSMAN (ARCHITECTURAL) in the Engineering Department, Area Board Headquarters, Electricity House, Love Lane, Liverpool 3. Salary £547 to £651 per annum (N.J.B. Schedule "D," Grade 5). Applicants must have experience in building work as applied to industrial and commercial premises and/or reinforced concrete structures and foundations, and should preferably have obtained the Higher National Certificate or attained equivalent standard. Application forms obtainable from the Establishments Officer at the above address.

The appointments are superannuable and subject to medical examination.

Closing date for above posts, October 6, 1952. (B 158)

BRITISH ELECTRICITY AUTHORITY

Yorkshire Division

GENERAL ASSISTANT ENGINEER (Efficiency and Testing Department) required at Divisional Headquarters, Leeds.

Duties comprise assisting in the testing of boilers, turbo-generators, cooling towers and power station auxiliaries, calculation of efficiencies, etc. Applicants should have the Higher National Certificate or equivalent qualification, and operation experience, particularly boiler house and combustion will be an advantage.

Superannuation Scheme National Joint Board conditions, salary £481—£674 per annum, Schedule C, Grade 8, Class "AX/DX," commencing within the scale £481—£619 per annum according to experience and qualifications.

Application forms obtainable from Divisional Secretary (Establishments), British Electricity Authority, Yorkshire Division, British Electricity House, St. Mary's Road, Leeds, 7, to be returned within 14 days of the appearance of this advertisement. (B 170)

BRITISH ELECTRICITY AUTHORITY

South Western Division

STATION SUPERINTENDENT required for the new East Yelland Generating Station, near Barnstaple, Devon (ultimate capacity 180 MW—N.J.B. Class "H").

Applicants should have had a good technical education and considerable practical experience in the operation, maintenance and administration of a modern generating station.

Corporate Membership of the Institution of Mechanical Engineers and/or the Institution of Electrical Engineers or equivalent qualification desirable.

Initial salary N.J.B. Grade 1, Class "G," £1,133 to £1,184. Superannuation.

Apply by October 6, 1952, stating age, qualifications, experience, present appointment and salary, to R. C. Barrett, Divisional Secretary, 26 Oakfield Road, Bristol 8. (B 156)

YORKSHIRE ELECTRICITY BOARD

No. 7 (Grimsby) Sub-Area

APPLICATIONS are invited for the following appointment:

SALES REPRESENTATIVE
Gainsborough District
(Vacancy No. 7/31/52)

Applicants will be required to give advice within well-defined instructions and under close supervision to both urban and rural consumers in respect of new supplies and sales of domestic and agricultural equipment. They should be able to advise consumers on all types of domestic and agricultural installations and prepare estimates in this connection.

Salary, N.J.C., Grade 1, £360 to £450 per annum.

Applications, stating the above vacancy number, and giving full details of age, qualifications, and experience, should be forwarded to the Manager, No. 7 (Grimsby) Sub-Area, Yorkshire Electricity Board, Moss Road, Grimsby, not later than October 9, 1952. (B 173)

BRITISH ELECTRICITY AUTHORITY

Midlands Division

FIRST ASSISTANT CONTROL ENGINEER required in System Operation Department, Divisional Headquarters, Birmingham. National Joint Board service conditions, superannuable appointment, commencing salary in accordance with Schedule C, Grade 5, £629 to £765, ultimately rising to £858.

Higher National Certificate in electrical engineering or equivalent qualification required, together with sound practical training in connection with system operation and control. Generating station experience an advantage.

Application forms, obtainable from Establishments Officer, 53 Wake Green Road, Moseley, Birmingham 13, to be returned by October 11, 1952.

F. W. LAWTON,
Divisional Controller.
(B 179)

LONDON ELECTRICITY BOARD

TECHNICAL ASSISTANT
Design and Planning Branch

APPLICATIONS are invited for the above position in the Engineering Department of the North Eastern Sub-Area Headquarters at Stratford, E.15.

Applicants should have received a sound general and technical engineering training to Graduate I.E.E. standard, should have served an engineering apprenticeship with an electrical manufacturer or supply authority and should have some practical experience on distribution.

The post is graded under Schedule A of the National Joint Board Agreement as Class "K," Grade 13, £591 3s. per annum, rising to £614 5s. per annum, inclusive of London Allowance.

Application forms, obtainable from Establishments Officer, 46 New Broad Street, E.C.2, to be returned completed by October 6, 1952. Please enclose addressed foolscap envelope and quote ref. V/1481/T on all correspondence. (B 174)

BRITISH ELECTRICITY AUTHORITY

Midlands Division

ASSISTANT MAINTENANCE ENGINEER (ELECTRICAL) is required at Hams Hall "A" Generating Station, near Birmingham. N.J.B. service conditions, superannuable appointment, salary within Schedule "A," Grade "J" 9, commencing at £699 per annum.

Higher National Certificate in electrical engineering or an equivalent qualification is required, together with sound technical training and practical experience in power station electrical maintenance.

Forms of application are available from the Establishments Officer, 53 Wake Green Road, Moseley, Birmingham 13, to be returned by October 11, 1952.

F. W. LAWTON,
Divisional Controller.
(B 175)

BRITISH ELECTRICITY AUTHORITY

South West Scotland Division

APPLICATIONS are invited for the position of SENIOR ASSISTANT ENGINEER in the Technical Department at Divisional Headquarters, Glasgow. The salary will be within the range £945/£1,141, and the post is superannuable.

Applicants should have technical qualifications to degree or I.E.E. Associate Membership standard and have a wide experience in the supply or manufacturing industries relating to generation and high voltage transmission problems. The duties require a particular knowledge of system design and extension, the estimation of fault levels and load flows, and the design and application of switchgear and protective gear.

Application forms may be obtained from the Divisional Secretary, 168 Broomhill Drive, Glasgow W.1, and should be returned to him before October 9, 1952. (B 169)

LONDON ELECTRICITY BOARD

SENIOR DRAUGHTSMAN

APPLICATIONS are invited for the above position in the Design and Planning Branch of the Northern Sub-Area at Aldersgate Street, E.C.1.

Applicants should have had training and experience in building construction and the design of steelwork and reinforced concrete structures, and be capable of preparing drawings and making calculations for the alteration of existing premises and the conversion of basements into substations and transformer chambers. Experience in the layout of electrical equipment up to 11 kV, whilst not essential, would be an advantage.

The post is graded under Schedule D of the National Joint Board Agreement as Senior Draughtsman, Grade 5, £574 7s. to £683 11s. per annum, inclusive of London Allowance.

Application forms, obtainable from Establishments Officer, 46 New Broad Street, E.C.2, to be returned completed within 10 days of the publication of this advertisement. Please enclose addressed foolscap envelope and quote ref. V/1468/T on all correspondence. (B 178)

BRITISH ELECTRICITY AUTHORITY

South Western Division

STATION SUPERINTENDENT required at Castle Meads Generating Station, Gloucester.

Superannuation scheme. Salary N.J.B. Class "E," Grade 1, £997 to £1,040.

Applicants should have had a good technical education and considerable practical experience in the operation, maintenance and administration of a modern generating station.

Preference will be given to candidates who are corporate members of the Institution of Mechanical Engineers and/or the Institution of Electrical Engineers, or who hold equivalent qualifications.

Apply, by October 4, 1952, stating age, qualifications, experience, present appointment and salary, to R. C. Barrett, Divisional Secretary, 26 Oakfield Road, Bristol 8. (B 172)

BRITISH ELECTRICITY AUTHORITY

North Eastern Division

APPLICATIONS are invited for the appointment of SECOND ASSISTANT ENGINEER in the Steam Testing Department with headquarters at Dunston Power Station.

Applicants should possess a degree in engineering or equivalent qualifications and have had experience in the organising and carrying out of comprehensive tests on turbo alternator plant. They should also have a good knowledge of thermodynamics and be capable of the assessment and presentation of complete test data.

Salary in accordance with Grade 2, Schedule "C" of the N.J.B. Agreement (£809 to £1,000 per annum) and the post is superannuable.

Forms of application from the Divisional Establishments Officer, British Electricity Authority, North Eastern Division, Carliol House, Newcastle-upon-Tyne 1, to whom they should be returned before October 8, 1952. (B 157)

BRITISH ELECTRICITY AUTHORITY

London Division

DEPUTY STATION SUPERINTENDENT
Bow Generating Station

QUALIFICATIONS: sound technical training and organising ability, and wide experience in efficient operation and maintenance of power station plant. Ability to deal with staff problems.

Salary in accordance with N.J.B. Schedule, Class "F," Grade 3, £931/7/- per annum inclusive of London Allowance. Superannuation.

Applications should be addressed to Divisional Secretary, London Division, Ergon House, Horseferry Road, S.W.1, within 14 days of this advertisement. (B 184)

CENTRAL ELECTRICITY BOARD
FEDERATION OF MALAYA

ASSISTANT POWER STATION SUPERINTENDENT (M.28769.B) and TURBINE ROOM SUPERINTENDENT (M.28771.B) required by the Central Electricity Board, Federation of Malaya. Option of appointment either (a) on agreement for three years in the first instance leading, subject to satisfactory service, to an offer of permanent employment on the pensionable establishment, with opportunity of terminating appointment at the end of the first year's service if so desired, or (b) on contract for three years with a gratuity on satisfactory completion of final service at the rate of £70 for each completed period of three months' service. Allowances additional to those mentioned below payable to married men according to dependents. Free passages. Liberal leave on full salary.

ASSISTANT POWER STATION SUPERINTENDENT. Salary (including allowances) payable in local currency equivalent at present Government rate of exchange to £1,904 rising to £2,100 a year. Candidates must have wide experience of station maintenance and operation and preferably have held a similar position in a steam power station of not less than 80 MW capacity or as a charge engineer for at least five years in a station of not less than 120 MW capacity.

TURBINE ROOM SUPERINTENDENT. Salary (including allowances) payable in local currency equivalent at present Government rate of exchange to £1,687 rising to £2,100 a year. Candidates must have had considerable specialised experience in the repair and maintenance of steam turbines, preferably of Parsons type and should have served a good works apprenticeship on steam turbine or turbo-alternator manufacture. They should preferably be Corporate Members of the Institution of Mechanical or Electrical Engineers or of the Institute of Marine Engineers or hold a Higher National Certificate or a 1st class M.o.T. Steam Certificate, but candidates not so qualified would be eligible for salary on a lower scale equivalent to £1,673 rising to £1,862 a year.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London S.W.1, quoting on letter the reference number against the appointment for which application is made. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (B 155)

HER MAJESTY'S COLONIAL SERVICE

APPLICATIONS are invited for the following post:—

ELECTRICAL ENGINEER (C.S.D.79/4/01), Nyasaland. Duties include maintenance and operation of steam power and diesel plant. Salary scale £655 to £1,320 per annum, with additional cost-of-living allowance, the point of entry being determined by war service and experience. Commencing salary of approximately £1,005 for particularly suitable candidate. Appointment will be on three years' protation for pensionable employment. Free passages, once each way each tour, will be granted to the officer, his wife, and children up to the cost of one adult passage. Quarters, if available, are provided at low rent and leave is granted at the rate of 5 days for each month of service after a tour of 2-3 years.

Candidates (maximum age limit 40) should have passed or be exempt from Sections A and B of the Associate Membership Examination of either the Institution of Electrical Engineers or the Institution of Mechanical Engineers, with experience of steam power stations and with knowledge of normal chemical analysis.

Intending candidates should apply in writing to the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith Street, S.W.1, giving brief details of their age, qualifications and experience. They should mention this paper and quote the reference number (C.S.D.79/4/01). (B 180)

CROWN AGENTS FOR THE COLONIES

SHIFT CHARGE ENGINEERS required for Central Electrification Scheme in Cyprus, for two tours each of two years in first instance, with option of receiving gratuity on satisfactory completion of final service at the rate of £25 for each period of three months or becoming a contributor to a superannuation fund. Salary according to age and experience in scale £658 rising to £990 a year (including cost-of-living allowance). Free quarters and passages. Liberal leave on full salary. Candidates must have served an apprenticeship to mechanical engineering and have had experience of oil-fired boilers and turbo-generating sets. They should preferably have had experience in the operation of a modern generating station, but experience as a C.E.R.A. would be acceptable.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4 Millbank, London S.W.1, quoting on letter M.28674B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with the applicants selected for further consideration. (B 181)

BRITISH ELECTRICITY AUTHORITY

East Midlands Division

APPLICATIONS are invited from suitably qualified engineers for the following positions in this division:—

GENERAL ASSISTANT ENGINEER
Transmission Dept., Northampton Section
(Vacancy No. 90/52)

Applicants should have experience in the operation and maintenance of h.v. transmission lines and substations up to and including 132 kV and should preferably be graduate members of the Institution of Electrical Engineers.

The salary will be in accordance with Class "AX/DX," Grade 8 (£481-£674 p.a.), Schedule "C" of the National Joint Board Agreement.

Closing date for receipt of applications, October 11, 1952.

ASSISTANT MAINTENANCE ENGINEER (ELEC.)
Staythorpe, near Newark (Vacancy No. 92/52).

Candidates should have had a thorough training in electrical engineering and possess considerable experience in the maintenance of all types of electrical equipment found in large generating stations. Preference will be given to engineers who possess a Higher National Certificate in Electrical Engineering or its equivalent.

The salary will be in accordance with Class "J", Grade 8 (£739-£771 p.a.) of the National Joint Board Agreement.

A rented house, newly built for the authority, is available.

Closing date for receipt of applications, October 14, 1952.

The above positions are pensionable within the provisions of the British Electricity Authority and Area Boards' superannuation scheme.

Application forms may be obtained from the Divisional Establishments Officer, British Electricity Authority, Barker Gate, Nottingham, and should be returned to the undersigned. Please quote vacancy number.

L. F. JEFFREY,
Divisional Controller.

September 19, 1952. (B 177)

NORTH WESTERN ELECTRICITY BOARD

APPOINTMENT OF GENERAL ASSISTANT ENGINEER
Design and Planning Section, Sub-Area Technical Engineer's Department, Manchester.

APPLICANTS should have received technical education to H.N.C. level, and preferably be chartered electrical engineers.

The duties require a knowledge of the engineering problems in large industrial city networks. Candidates should be familiar with h.v. switchgear, protective systems and metering equipments, and be able to conduct technical correspondence.

Salary scale: £641 to £661 p.a. Grade M.13. N.J.B. conditions.

Applications to Sub-Area Secretary, No. 1 Sub-Area, North Western Electricity Board, Town Hall, Manchester, P.O. Box 493, by October 4, 1952.

APPOINTMENT OF GENERAL ASSISTANT ENGINEER
(OPERATION AND MAINTENANCE)
Sub-Area Engineer's Department, Oldham.

Applicants should have a knowledge of the operation and maintenance of large industrial and rural h.v. and l.v. networks, including both o/h lines and u/g cables. Graduate membership of the Institution of Electrical Engineers or exempting qualifications will be an advantage.

Salary scale: £563 to £585 p.a. Grade K.13. N.J.B. conditions.

APPOINTMENT OF GENERAL ASSISTANT ENGINEER
(TESTING ASSISTANT)
Sub-Area Testing Station, Stalybridge.

Applicants should be experienced in general testing work on a distribution system, including laboratory and field testing of protective gear, h.v. cables, switchgear and Ripplay equipment. Experience in installation of industrial metering equipment will be an advantage. Applicants should preferably be of H.N.C. standard.

Salary scale: £563 to £585 p.a. Grade K.13. N.J.B. conditions.

Applications for the above posts to Sub-Area Manager, No. 3 Sub-Area, North Western Electricity Board, Union Street, Oldham, by October 4, 1952. (B 202)

ASSISTANT required to Chief Technical Engineer to undertake test and development work on electrical appliances, both domestic and industrial, in the Dudley area. First class technical qualifications and experience necessary. Excellent opportunity for a candidate with personal initiative. Salary, £650.—Please reply to Box No. 2043, Electrical Times. (B 165)

BOX No. replies to be addressed to the ELECTRICAL TIMES, Sardinia House, Sardinia Street, London W.C.2

Engagement of persons must be made through a Local Labour Office or Scheduled Employment Agency, if the applicant is a man aged 18-64, or a woman aged 18-59, unless the person concerned is excepted or the employment is in a managerial or professional capacity, or is otherwise excepted from the provisions of the Notification of Vacancies Order, 1952.

ARMATURE WINDERS and FITTERS. Experienced men required for heavy electrical plant. Excellent earnings and working conditions.—Apply Labour Office, General Electric Co., Ltd., Witton, Birmingham, 6. (A 718)

BRITISH ELECTRICITY AUTHORITY requires, in the Civil Engineering Branch (Generation Construction) at Headquarters in London, SENIOR QUANTITY SURVEYOR (Senior Assistant Engineer, N.J.B. Grade 1, £975-£1,353) responsible to the senior civil engineer for critical examination of tenders and other documents, costing and price analysis in connection with power station contracts, including detailed consideration of pricing of tenders for civil engineering and building works, co-ordination of methods of preparing bills of quantities and assisting with negotiations and the consideration of claims. Candidates should be chartered quantity surveyors and must have wide up-to-date experience on building and civil engineering contracts for modern power stations

Applications, stating age, qualifications, experience, present position and salary, to D. Moffat, Director of Establishments, British Electricity House, Winsley Street, London W.1, not later than October 13, 1952. Quote reference AE/290. (B 186)

CABLE FOREMAN required for outside contract work in this country. Must have good experience in handling cables of all classes up to 33 kV and in organising trench work. State age, experience and salary expected to Employment and Welfare Manager, Johnson and Phillips Ltd., Victoria Works, Charlton, London S.E.7. (B 185)

DRAUGHTSMAN required with experience in detailing traction motors for straight electric and Diesel electric applications. The post offers special prospects for suitable applicant.—Apply, stating age, whether married, and giving full details of previous experience, to Personnel Officer, Crompton Parkinson, Ltd., Chelmsford. (B 132)

ELECTRICAL ENGINEER required by leading manufacturers of rotary, tumbler and motor control gear. Preference given to young man with electrical degree residing in London who possesses some commercial experience. Excellent prospects.—Write, stating experience, age and salary to Box No. 2057, Electrical Times. (B 203)

ENGINEER IN CHARGE OF ELECTRICAL REPAIR SHOP required by The Steel Company of Wales Limited (Steel Division). Applicants should be Corporate Members of the Institute of Electrical Engineers, with experience of electrical repair shop work in large industrial organisation.—Applications, in own handwriting, giving full details of training, etc., should be addressed to The Personnel Superintendent, The Steel Company of Wales Limited, Box No. 3, Port Talbot. (B 164)

HANDLEY PAGE (Reading) LTD., The Aerodrome, Woodley, Reading, have a vacancy in their Design Office for a SENIOR AIRCRAFT ELECTRICAL DRAUGHTSMAN. They have an interesting project in hand and the post is progressive and offers good scope for advancement to the right man.—Please send full particulars to the Personnel Officer. (B 21)

JOHNSON and PHILLIPS, LTD., require a SENIOR TESTER in their Switchgear Works. Applicants should be of National Certificate standard and have experience in testing industrial switchgear up to 11 kV. —Applications in writing, stating age, training, experience and salary required to Employment and Welfare Manager, Johnson and Phillips, Ltd., Charlton, S.E.7. (B 102)

OPPORTUNITIES occur in London area for SENIOR DRAUGHTSMEN for work on development and mechanical design of electrical machinery; 5-1,500 h.p. Exceptional salaries for capable men.—Box No. 2025, Electrical Times. (B 112)

REPRESENTATIVES with good knowledge of electrical engineering required for Midland and Northern areas, to represent well-established manufacturers of transformers, rectifiers, discharge lamp gear, etc.—Box No. 2039, Electrical Times. (B 160)

SALESWOMAN/DEMONSTRATOR is required by a prominent manufacturer of domestic appliances. It is essential that applicants should have experience of cookers, refrigerators, etc.—Please write, giving full particulars of experience and salary required, in confidence, quoting ref. AJBG, to Box 2041, Electrical Times. (B 163)

SIMPSON, BAKER AND CO., LTD., Electrical and Radio Wholesalers, require SALES REPRESENTATIVES to develop the industrial and user business in the Midlands. Applicants should be conversant with motors, switch and control gear, cables and electric power tools. —Apply, giving full particulars of previous experience, age, etc., to Area Sales Manager, Hockley and Unett Street, Birmingham 19. (B 159)

UNILEVER LIMITED invite applications for the post of ELECTRICAL ENGINEER for large N.W. London factory. Responsible for staff and maintenance of all electrical plant, comprising public supply, diesel alternators, sub-stations, h.t. ring main, transformers, h.t. and m.t. switchgear, motors, starters, lighting and all associated distribution cables. Applicants should be between 30 and 40 years of age, have held a post with similar responsibilities and must have thoroughly sound practical experience of electrical installation and maintenance. Preference given to A.M.I.E.E., but applicants must hold at least H.N. Certificate. Superannuation scheme, salary according to experience, appointment subject to medical examination.—All applications, which may contain copies of two or more recent testimonials, will be treated in the strictest confidence, and should be addressed to Personnel Division (KAB 38), Unilever Limited, Unilever House, Blackfriars, London E.C.4. (B 119)

APPOINTMENTS WANTED

ELECTRICAL ENGINEER, aged 32, experienced in estimating, planning and supervising domestic and industrial power, heating and lighting schemes. For electrical contractors. Alternatives considered. Well educated, with own car.—Box No. 2047, Electrical Times. (B 187)

ELECTRICAL ENGINEER, B.A.Sc., age 30, experienced as electrical superintendent of large mining operation, hydro and diesel plants, desires situation, local or foreign, in field of industrial applications, operation, maintenance, construction.—Reply to Box No. 2037, Electrical Times. (B 147)

SALES REPRESENTATIVE (32), single, representing cable and wire manufacturers, S. Wales, West England, seeks situation preferably Lancashire or North England. Other areas considered. Clerical, sales experience, some electrical knowledge.—Box No. 2013, Electrical Times. (B 98)

WORK WANTED

A.C. and d.c. Motor Rewinds and Repairs. Prompt service, fully guaranteed. Edgware 5566 (4 lines). —Service Electric Co., Ltd., Stanmore, Middx. (A 19)

CASTINGS. Fisher Foundries, Ltd., Greet, Birmingham, have capacity for brass, gun metal and soft grey iron machine moulded repetition castings weighing 1-30 lb. Loose pattern work up to 3 cwt. Delivery by road to all parts. Tel.: B'ham, Victoria 0197. (A 647)

DRAWING OFFICE SERVICE. Immediate capacity for the design and detail of jigs and fixtures, press tools, structural and mechanical engineering.—Write or call: H. Downing and Co., Railton House, Railway Drive, Bilston, Staffs. (B 190)

METALWORK. All types cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks, Ltd., Chapman Street, Loughborough. (A 352)

MOTOR GENERATOR SETS built to customers' requirements from new and/or modern reconditioned machines. Guaranteed for twelve months. Good deliveries, competitive prices.—Enquiries to Thos. W. Ward, Ltd., Albion Works, Sheffield. Tel. 23611 (Ext. 347). (B 189)

ZEROS REFRIGERATORS. Complete range of REPAIR AND SERVICE now available. Equipment reconditioned to pre-war manufacturers' specifications.— Time Engineers, Ltd., Refrigeration Specialists, Victory Road, Rainham, Essex (Rainham 4625), or Southern Area Agency (Tel.: Springpark 4217). Electrical spares supplied to the trade. (B 55)

WANTED

A.C.-D.C. MOTORS, STARTERS, complete change-over installations, etc.—A.A. Electrical Co., Ltd., 67 Rothschild Road, Chiswick Park, W.4. Tel.: Chiswick 5105. (A-11)

£50,000

Immediate cash available for purchase of New Ball and Roller Bearings, all types. Steel Balls and Rollers. Top prices paid. Purchases from Traders only.

CLAUDE RYE BEARINGS

895-921 Fulham Road, London, S.W.6

RENown 6174 (20 lines) (A 328p)

WANTED, D.C. and A.C. ball-bearing MOTORS, MOTOR GENERATOR SETS, DYNAMOS and ALTERNATORS.—Full details to Britannia Manufacturing Co., Ltd., 22-23 Britannia Walk, London N.1. (A 7)

WANTED for prompt cash, ferrous and non-ferrous SCRAP; also plant for dismantling. Buyers of secondhand machinery and plant for re-use.—W. and H. Cooper, Ltd., 176 Brady Street, Bethnal Green, E.1. (A 1)

WANTED. Large quantity of 4-in. outside diameter TUBES from the dismantling of old Babcock Water-tube boilers. Best prices paid. Prepared to purchase Babcock and Wilcox Water-tube boilers for dismantling. —Apply, giving full details to Midland Iron and Hardware Co., Cradley Heath, Staffs. (A 3)

WANTED, ROTARY CONVERTORS, any size.—Universal, 221 City Road, London E.C.1. (A 9)

AGENCIES

FLUORESCENT tube refilling specialists require AGENTS in all areas excepting Lancs. Must have facilities for storing and distribution of tubes.— Qualpron (Elect.), 43 Crawford Street, Glasgow W.1. (B 133)

MANUFACTURERS of attractive range of Table Lamps and Lampshades of all types. Established over 25 years and well known in the trade, have available Agency for South of England and Home Counties. Liberal commission. An excellent agency for agent already calling on electrical trade, Boards and stores.—Box 2045, Electrical Times. (B 166)

MANUFACTURERS of popular domestic appliances require AGENTS for all areas of the British Isles. Must have live connections with reputable wholesalers, retailers, etc. Car essential. Reply in fullest detail. Present agents aware of the extensions to our sales staff. —Box No. 2049, Electrical Times. (B 188)

BUSINESS OPPORTUNITIES

ELECTRICAL, Mechanical and Electronic equipment manufacturers with sales representation in Scotland but no local servicing, maintenance and spares depot facilities and interested in obtaining these are requested to contact a Glasgow electrical engineering firm with commodious and well-situated workshop, storage and office premises who have a proposition to offer. All types of equipment considered. Full details supplied on request. —Box No. 2055, Electrical Times. (B 201)

FOR SALE

CABLES & WIRE

COPPER CONDUCTOR surplus to contract available for sale; approximate quantity 15 miles 3/·147, 25 miles No. 1 s.w.g., 16 miles No. 3 s.w.g., 30 miles No. 3/0 s.w.g., 10 miles 3/·158 cadmium copper.—Apply, Box No. 2051, Electrical Times. (B 191)

ELECTRIC BLANKET RESISTANCE WIRES, glass covered, plastic covered, Eureka nylon, 25, 60, 80 ohms per yard resistance. Large quantities available.—Write: Box No. 2029, Electrical Times. (B 122)

DOMESTIC APPLIANCES

IMMERSION HEATERS, GRUBB new 8 kW model. No Purchase Tax. All lengths 16 in. to 30 in. Provision for intermediate loading. Fully guaranteed. Immediate delivery.—Write for list and trade terms to Distributors, John Owner and Co., Ltd., Springfield Road, Birmingham 13. Tel.: Springfield 2939. (B 25)

GENERATING PLANT

DIESEL ALTERNATOR SETS in stock up to 500 kVA. 400/440 V, 3-phase, 50 c/s, 4-wire. Detailed stock list post free on request.—Thos. W. Ward, Ltd., Albion Works, Sheffield. Tel.: 26311 (Ext. 347). (B 135)

DIESEL ELECTRIC SETS, 30 kVA, 50 kVA, 75 kVA, 100 kVA and 150 kVA. Delivery ex stock. Inspection invited.—Boyce Weir and Co., Brookroyd Mills, Stainland, nr. Halifax, Yorks. Tel.: Stainland 2120. (B 209)

GENERATORS, L.D.C., 70 V, d.c., 3·5 kW, new, £50. Alternators, B.K.B., 230 V. a.c., 3 kVA, 1,500 r.p.m., self excited, new, £40. Alternators, L.D.C., 230 V, a.c., 1·25 kVA, 3,000 r.p.m., used, £15. Convertors, L.D.C., 24 V. d.c./110 V a.c., 0·4 kVA, new, £25. Dynamos, C.A.V. Type D8C58, 24 V, 35 amp. new, £60. Automatic control boards, £10.—British Films Ltd., Balham High Road, London S.W.17 (Balham 6677). (B 161)

STATIONARY GENERATOR UNIT, 22 kW Meadows 4-cylinder petrol engine direct coupled to Maclaren 400 V 3-phase 50-cy. a.c. generator. Complete with switch panel and in perfect order.—Haynes Ford and Elliott Ltd., Pritchett St., Birmingham 5. Ast. 3511. (B 192)

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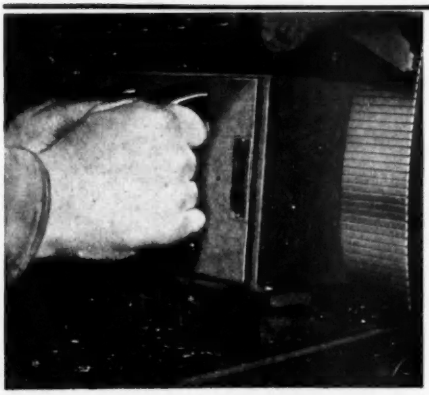

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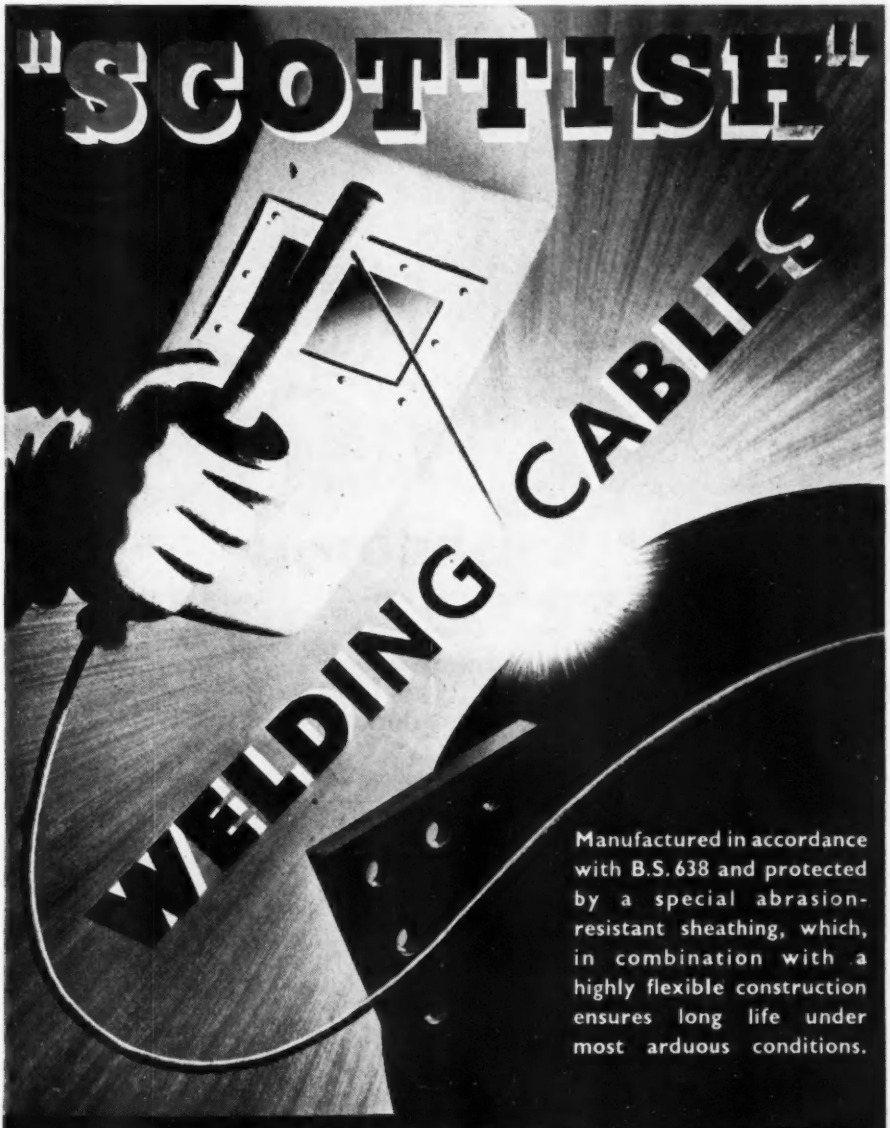
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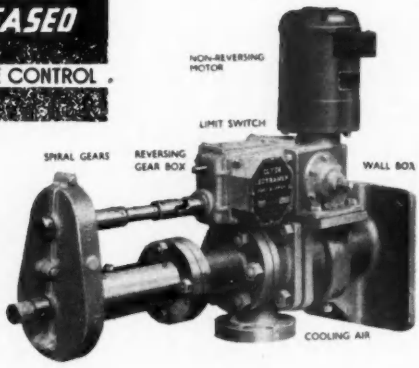

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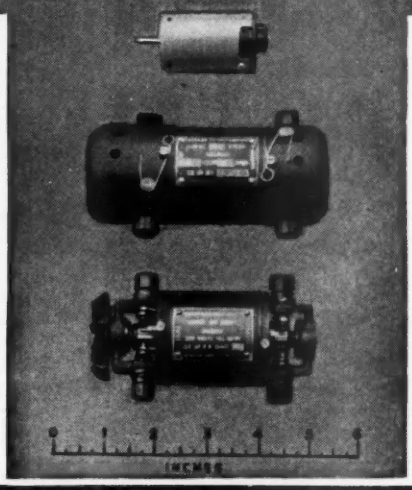

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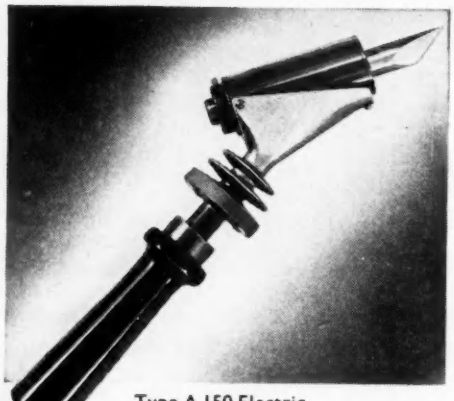

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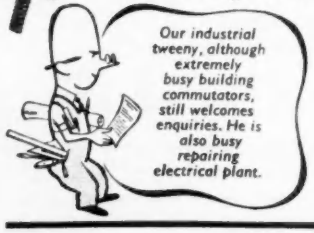
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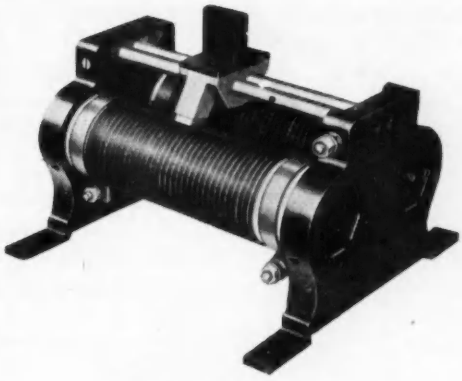

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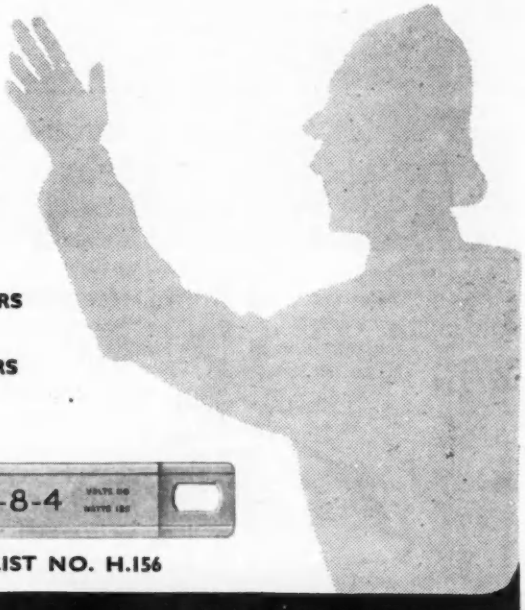

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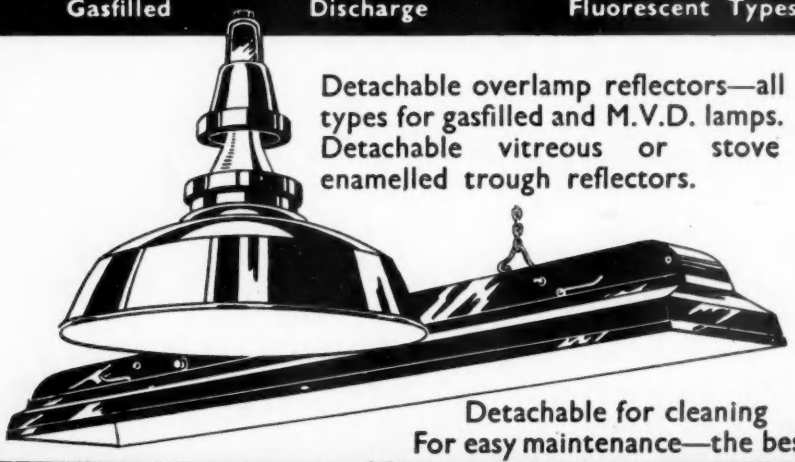

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12,000 amperes
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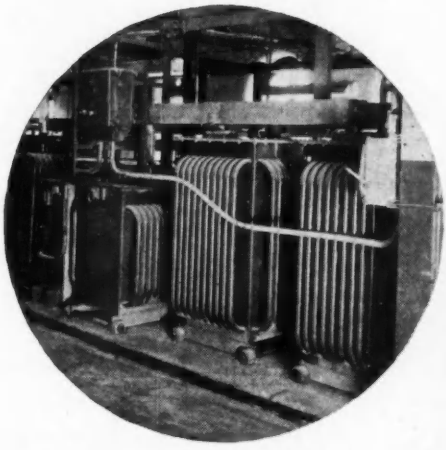
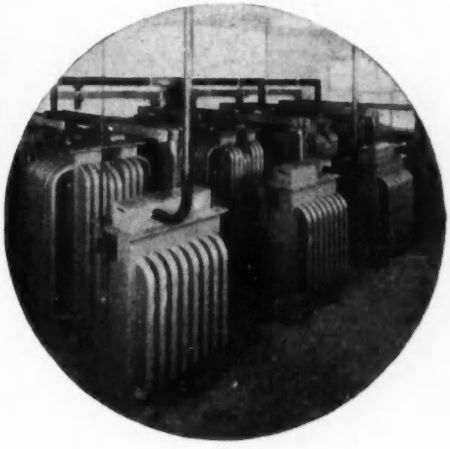
of the two plating plants installed by Messrs. W. Canning & Co., Ltd., Birmingham, by whose courtesy these photographs are reproduced.





The illustrations show Westalite oil-immersed rectifiers installed at Messrs. British Screw Co., Ltd., Leeds, and Messrs. Banks and Davis, Ltd., Birmingham, with outputs of 8,000 and 4,000 amperes respectively.

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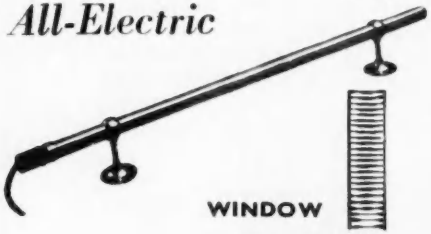

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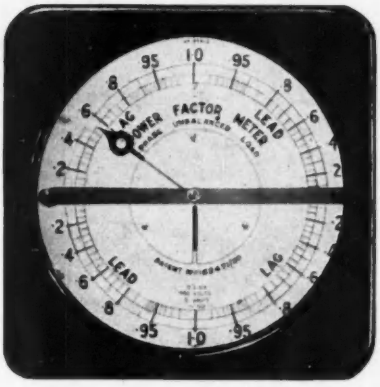

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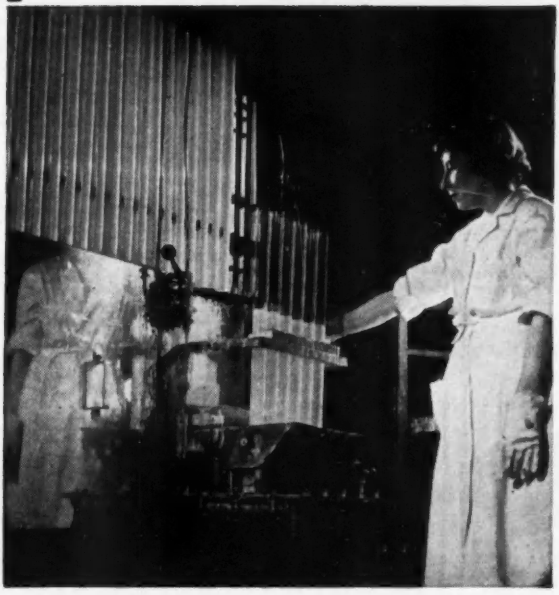

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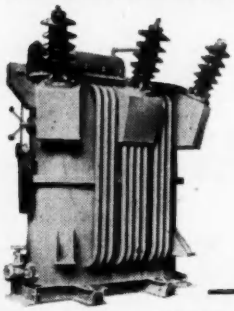

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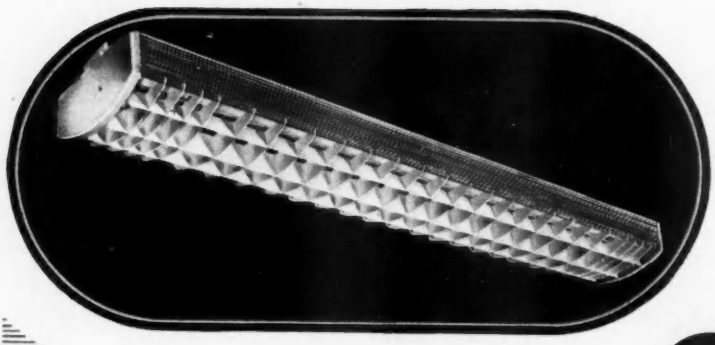

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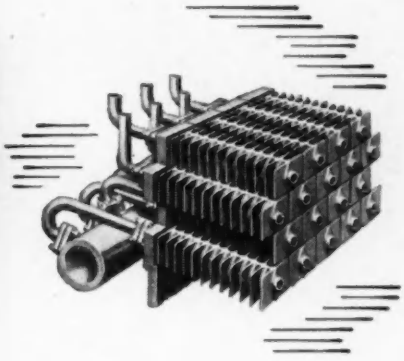

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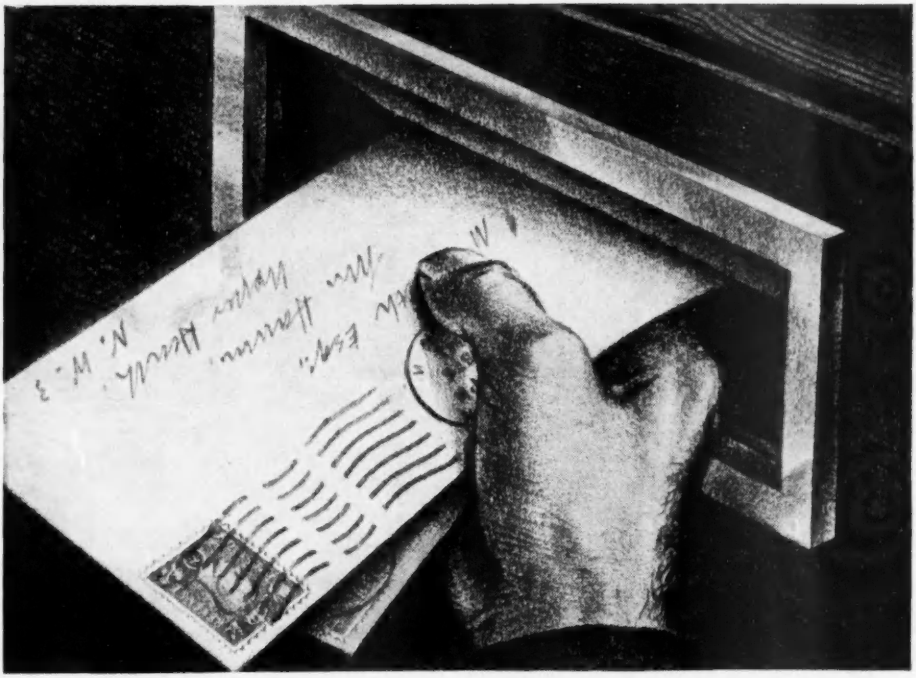

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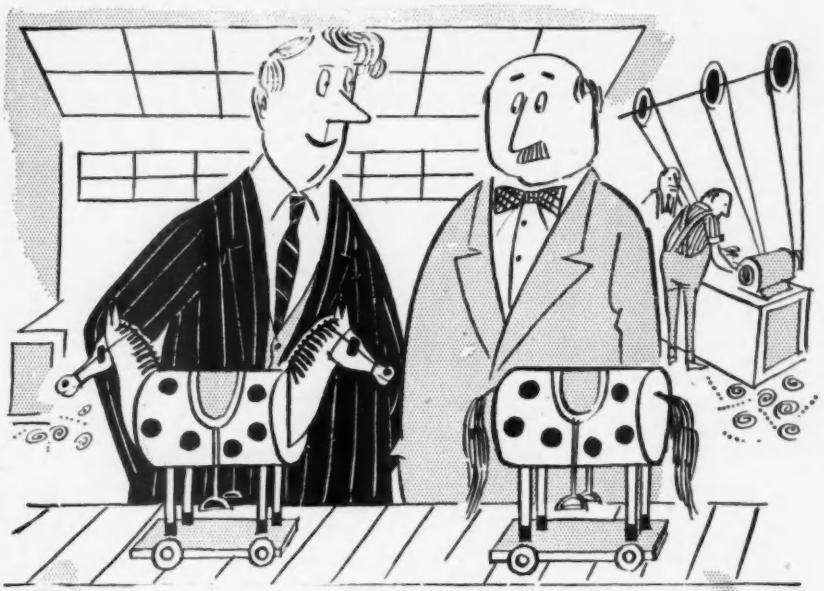

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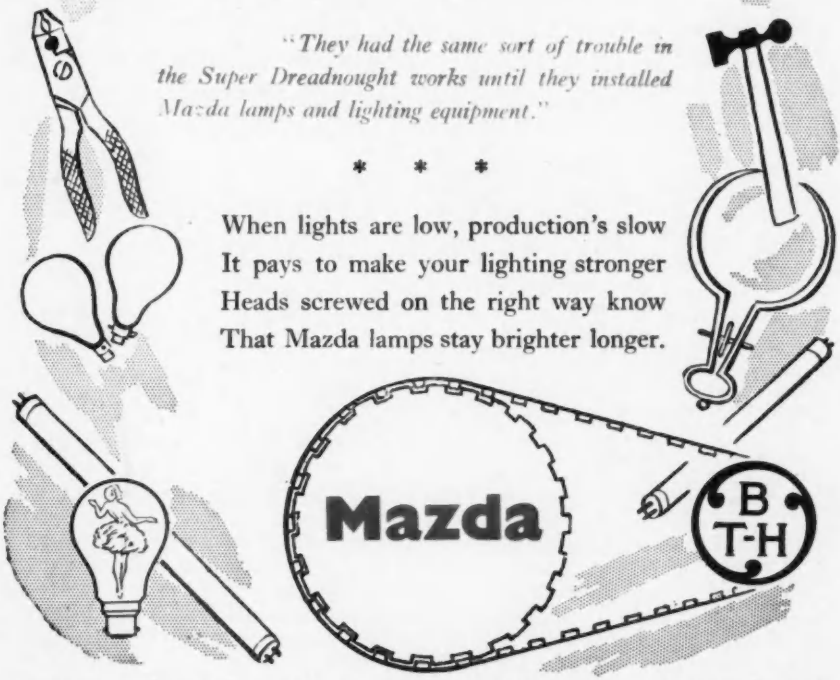

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